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Contents for June, 1948

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CHIPS FROM THE QUARRY

9th Annual Convention
California Federation of
Mineralogical Societies
July 16-18, 1948
Municipal Auditorium
Long Beach, Calif.
(Convention Chairman, 1850 E. Pacific Coast Highway, Long Beach 6, Calif.)

International Geological Congress
18th Session—Great Britain, 1948
Aug. 25-Sept 1, 1948
(A. J. Butler, Gen. Sec. Geological Survey and Museum, Exhibition Road, London, S. W. 7, England)

Some 1,100 geologists from countries overseas plus British geologists will swell the attendance to over 2,000. Twenty-eight Governments and about 160 universities and scientific institutions will be represented at this, the world's greatest geological congress which meets every two years and each time in a different country. Field trips to many geological and mineralogical localities are on the program.

Northwest Federation Convention
Sept. 4-5, 1948
Bozeman, Mont.
(H. E. Murdock, Vice-President, Bozeman, Mont.)

NORTHWEST FEDERATION CONVENTION SEPTEMBER 4-5, 1948

The free exhibition of Northwest gems and mineral specimens to be shown in Bozeman, Montana, Sept. 4-5, as part of the program of the annual convention of mineralogical societies, promises to be the largest ever brought together. It will also be the best housed. The main hall of the local armory will be roomy and well lighted. There will be 125 uniform display cases, each well lighted within by a shaded electric light. These cases, about 23 by 43 inches will be rented to commercial exhibitors, who will have gem and mineral specimens for sale; but free use will be allowed to individual non-commercial exhibitors and to club displays.

Police protection will be provided, day and night, for all displays.

Local interest in the displays will be very active. The local club has about 80 members, and the local exhibitions have drawn hundreds of visitors each year. Local papers have always given these exhibitions a great deal of good publicity. The exhibitions have always been free to the public, and the members have done the work gladly.

Bozeman is a college town, seat of the Montana State College, one of the Montana Greater University Institutions with more than 3,600 students. While the college will not be in session at the time of the convention, Campus-town, with its trailer houses, pre-fabs, and Quonsett huts, is worth a visit.

Bozeman is on U. S. Highway No. 10, which splits near Garrison in Western Montana. One line, No. 1 North comes east through Helena, capital of the state; and No. 10 South comes through Butte. The two unite again a little west of Bozeman. Travellers from the west cross the Jefferson, Madison, and Gallatin Rivers in succession close to the point where they unite to form the Missouri, which then flows north and west.

W. F. Brewer
Publicity Chairman
Bozeman Rock Club
720 South Third
Bozeman, Montana

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MINERAL COLLECTING IN MAGNET COVE, ARKANSAS

By WOODLAND G. SHOCKLEY

Since early in the nineteenth century Magnet Cove has been one of the world's most famous mineral localities. The many different mineral specimens found there, some of them quite rare, and the complex geologic relationships of the rocks have been the source of much study by students of the earth sciences for many years. Unfortunately, most of the published material on the Cove is either out of print or is otherwise hard to obtain; the most definitive report on the minerals of Magnet Cove was published in the annual report of the Geological Survey of Arkansas for 1890, entitled "The Igneous Rocks of Arkansas" by J. Francis Williams. Since that time many new minerals have been reported from this locality, but the writer knows of no article which brings the mineralogy of Magnet Cove up to date. It is the purpose of this article to record the minerals found by the writer and his fellow collectors in the past seven years of collecting at the Cove in the hope that their experiences will help the rockhound who wishes to obtain specimens from this famous locality.

Magnet Cove lies in southwest-central Arkansas about midway between the cities of Hot Springs and Malvern. United States Highway No. 270, a paved road, bisects the Cove from east to west, making it easily accessible to the collector. The small town of Magnet is on the highway at the eastern edge of the Cove. The Cove itself is roughly elliptical in shape having a diameter of about 3 miles east and west, and 2 miles north and south. The hills bordering the Cove form a rim around the outer edge which is broken only on the northeast and southwest where Cove Creek cuts through on its way south to the Ouachita River. The floor of the Cove is relatively flat and open except for small hills in the west central portion. Drainage is accomplished by Cove Creek and one small stream called "The Branch" which runs west and joins the creek at the highway bridge.

The distribution of rock types at the Cove roughly follows the shape of the basin. Outside of the area are the normal sedimentary rocks of the region (Paleozoic shale, sandstone, and novaculite). The outer rim of the Cove is a broad band of igneous rocks; inside of this there is a ring of metamorphosed sedimentary rock, and finally in the center of the Cove the igneous rocks are found to occur again, although here they are covered for the most part with overburden. Several bodies of metamorphosed calcite occur within the Cove, the largest of which has furnished many mineral specimens. A small hill near the center of the Cove is composed of a calcareous and siliceous tufa and appears to be the result of hot springs action. The igneous rocks are alkaline in nature and consist of predominantly nephelitic syenites with some monchiquites, tinguaites, and other basic types. Many theories have been advanced as to the formation of the Cove, but they will not be discussed in this paper; it will suffice to say that the formation is apparently intrusive in nature.

The writer has spent many pleasant days in the past seven years wandering over the hills and through the fields of Magnet Cove trying to obtain a representative collection of the minerals to be found from this region. Often the results have been discouraging, but an occasional lucky find more than repays the

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fruitless hours of searching and whets the appetite for future trips to this interesting spot. Countless rockhounds have visited the Cove and, if early reports of the exceptional mineral specimens found are true, they have done a pretty good job of removing the best items to their own collections. Good specimens of many of the better known minerals are not to be found without diligent searching. The average collector may, however, obtain many adequate specimens from some of the more recent mining and prospecting activities. Residents of the area are friendly and are willing to let you search to your heart's content on their property, but they do like to be asked before you trample their crops or leave the barnyard gate open.

The best areas for collecting at Magnet Cove today are where various mining and prospecting activities have been under way during the past several years. The first of these localities is Calcite Hill just west of the highway bridge at Cove Creek and north of the road. Recent excavation in the hill has exposed a considerable area of the calcite and excellent specimens of the associated minerals have been obtained. Vesuvianite, dysanalyte, magnetite crystals and carbonate-apatite are some of the specimens to be found here. A second locality is the titanium workings in the north central part of the Cove. Extensive stripping operations in the past few years have revealed good specimens of rutile, pyrite cubes, feldspar, and other allied minerals. Although the mines are not operating at present, good specimens are still to be found. About one-half mile north of Magnet, numerous test pits have been evcavated in a brookite and quartz area. Excellent specimens of brookite have been found here. A fourth location is along Cove Creek in the northeast corner of the Cove. Here, investigations are being conducted to determine the extent of a molybdenite deposit. Specimens of that mineral with pyrite, marcasite, feldspar, and some rutile are found here. The acccompanying sketch (Fig. 1) shows the general formation of Magnet Cove, indicating the more important localities for collecting specimens.

The following descriptions of Magnet Cove minerals include, chiefly, those found by the writer or known to have been found by fellow collectors. Many minerals reported from this locality are present only in microscopic form or are materials which are difficult to identify by elementary methods. With proper equipment it is probable that the list of minerals found here could be considerably extended. In the following descriptions those minerals not found by the writer or his acquaintances have been listed as "reported" by others. It is the hope of the writer that in the not too distant future a comprehensive examination of the mineralogy and geology of Magnet Cove will be made.

AEGIRITE:—Greenish black, lath-shaped crystals of ægirite are found in the syenite, associated with nephelite, microcline, and eudialyte. Terminated crystals are rare but the prisms are often several inches in length. In the contact metamorphic zone adjacent to the calcite, slender black prisms of ægirite are intimately associated with natrolite and thomsonite. Felted masses of light green minute crystals coating microcline and lining vugs in a medium grained syenite are also aegirite. A similar occurrence was reported by Landes to be epidote; however, specimens answering this description collected by the writer were found by optical examination to be ægirite. The most common locations for this mineral are at Cove Creek bridge and on The Branch where syenite dikes cut across the stream bed.

ALBITE:—Appears to be the most common of the feldspathic minerals in the vicinity of the titanium mine. Specimens showing well developed crystal faces up to one-half inch in size, white or pale brown in color, are frequently found. Encrusting masses, nearly botryoidal in form, of a gray or white color, are sometimes found coating the white feldspar rocks in this area; it is believed that the encrusting masses are also ablite. They have a faint deep pink fluorescence under the short wave ultraviolet light.

Albite is also found in the molybdenite workings. The material here consists of white crystals or compact masses, sometimes quite soft, indicating an alteration to kaolin.

ANALCITE:—Found as a white translucent crystal in a vug in coarse grained syenite rock. Some fluorescent hackmanite was also found in the same specimen. The analcite is a secondary mineral and the association here is very similar to that of the analcite found at Fourche Mountain near Little Rock, Ark.

ANATASE:—The titanium mineral anatase forms the composition of two minerals, hydrotitanite and leucoxene, which are found in the Cove. Descriptions of the minerals and their associations are

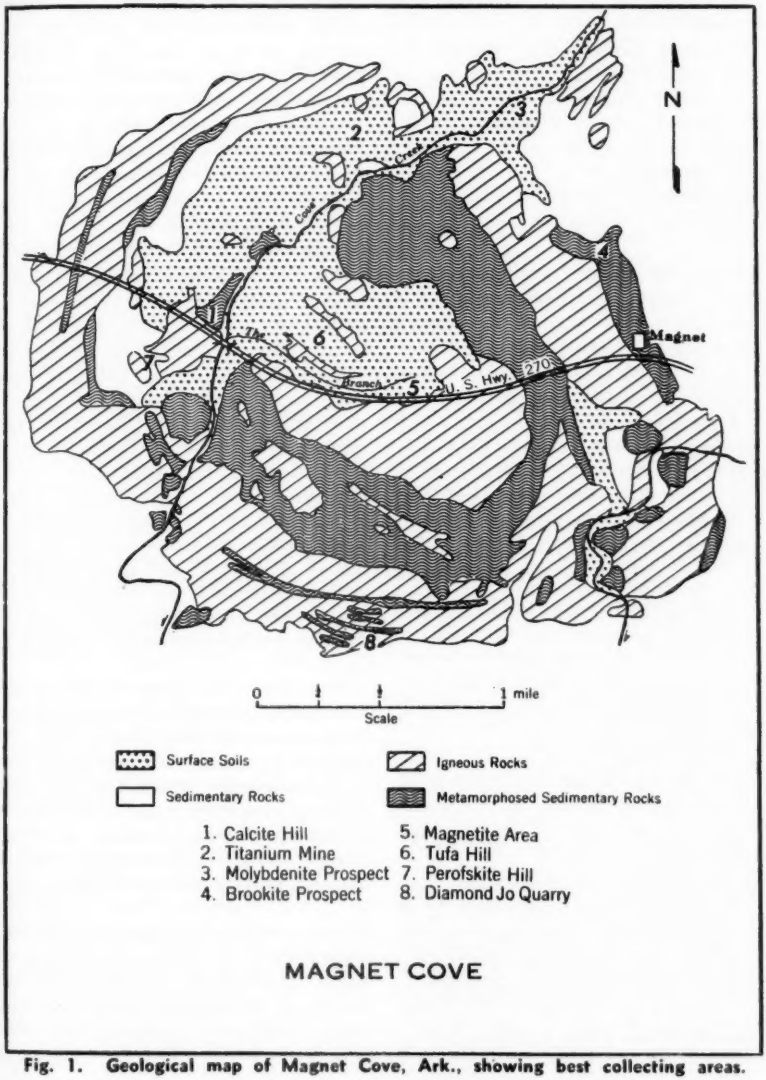

Fig. 1. Geological map of Magnet Cove, Ark., showing best collecting areas.

presented under their respective headings.

APATITE:—The material at Magnet Cove is of the fluor-apatite variety and has been found only in intimate association with the related carbonate-apatite. The most common occurrence is with nephelite, schorlomite, and melanite near the center of the Cove. The apatites form long, white, acicular crystals penetrating the garnet. The shell of the apatite crystals is generally carbonate-apatite with a dead white luster, whereas the central portion of fluor-apatite has a vitreous luster. A second occurrence of fluor-apatite has been reported from the titanium mines. Here, carbonate-apatite crystals are transparent. The variety carbonate-apatite is described more completely under its heading later in this paper.

ARAGONITE:—Recent mining operations on Calcite Hill have revealed the presence of a small amount of aragonite in the form of "Cave Coral". The material is in white, tufted, acicular crystals of minute size. Apparently the aragonite was deposited in fissures in the calcite. A second occurrence of aragonite at Calcite Hill is in the form of minute white tufts in vugs of a rock composed principally of small vesuvianite crystals. It is one of the few minerals found at the Cove which show decided fluorescence. Under the short wave ultraviolet light the aragonite has a pale yellow fluorescence and phosphorescence.

ASTROPHYLLITE:—Reported as occurring in the pegmatite rock near the highway bridge over Cove Creek, in brownish yellow plates.

AUGITE:—Reported to occur in monchiquitic dike rock near Cove Creek in the north central portion of the Cove. Specimens of this material are rare and difficult to find.

BARITE:—Found as a secondary mineral in a vug of dense green and black rock at Calcite Hill. The vug was lined with small, clear, and white calcite crystals; the barite crystals were growing on the calcite. They were clear, tabular, and about one-eighth inch in size. A description of the Magnet Cove minerals would not be complete without mention of the barite deposit on Chamberlain Creek, some two miles northeast of the Cove. The barite occurrs in the highly folded sedimentary rocks as beds of earthy compact material, dark gray in color but sometimes banded with red and light gray. Infrequently, vugs are found in which the barite has crystallized into small, well-formed, transparent crystals which often have an iridescent black coating on them. The barite crystals are both fluorescent and phosphorescent, a pale yellow, while the earthy material is phosphorescent only. Mining operations have been carried on for several years in this deposit and are still continuing.

BEIDELLITE:—Reported to occur as an alteration product in the clays at the titanium mines and the brookite prospect.

BIOTITE:—Occurrs in the overburden soil in the central part of the Cove as dark green plates usually less than one inch in size. Alteration of the mica into protovermiculite often produces specimens with white banding around the outer edge of the plates; these make quite interesting specimens. Green biotite in small books is also found in the coarsely crystalline calcite dikes outcropping in the stream bed of the Branch. Brown and black biotites are found in the mica syenites (biotite ijolite and jacupirangite) at various locations in the Cove. Black biotite is also reported as occurring with sodalite in the south-central part of the Cove.

BROOKITE:—Brookite is found in a belt extending generally north and south along the eastern side of the Cove. The mineral is associated with milky quartz or with the peculiar mottled smoky quartz crystals, often stained with iron (limonite or hematite). The brookite occurrs as bright, shiny black crystals, well terminated, varying from pinhead size up to an inch in diameter. Until a short time ago, the average collector had difficulty in finding good specimens of brookite, but recent explorations in the area have turned up much good material. In the north-central part of the Cove, brookite crystals are found which have completely

altered to rutile; for a description of these paramorphs see the description of rutile below. Recent excavation in the molybdenite prospect have brought to light a number of small, but well formed, brookite crystals. These are generally found in vugs in a white, decomposed, feldspathic rock.

BRUCITE:—Has been reported as occurring in very small plates in the eudialyte syenite rock.

CALCITE:—The calcite at the Cove may be grouped into two general classifications, primary and secondary. The primary calcite is by far the most common. A large mass of coarsely crystalline calcite is found just west of Cove Creek bridge. The deposit extends over several acres and has been mined for its lime content. The calcite it white to gray, coarsely crystalline, showing excellent cleavage; no crystal terminations are seen. Disseminated throughout the calcite are crystals and grains of magnetite, dysanalyte (columbian perovskite), pyrite, vesuvianite, monticellite, and other minerals. Carbonate-apatite in radiating patterns is seen in fracture seams of some of the calcite. Wollastonite and thomsonite have been reported as contact minerals at the boundary between the calcite and the syenite rocks. Small areas of calcite are to be found at other locations in the Cove.

Secondary calcite has been found filling small vugs in a dark, fine-grained rock at Calcite Hill. The mineral is cream colored and has good terminations, although the crystals are small. Terminated calcite crystals (rhombohedrons) are found encrusting crystalline calcite in the rutile mine. They are white and generally have a brown surface stain coating the crystals. It was impossible to determine from the specimens obtained whether this occurrence was primary or secondary.

The calcite at Magnet Cove has a yellow thermoluminescence. Scattered specimens from the calcite pit also have a pink fluorescence under the short wave ultraviolet light; however, the color is very faint.

CANCRINITE:—Reported as an alteration product in some of the syenite rocks.

CARBONATE-APATITE:—The occurrence of this mineral is widespread in the central area of the Cove. On the "tufa" hills north of the highway and on both sides of Cove Creek there is a considerable amount of carbonate-apatite in botryoidal encrustations and cellular masses. The color is white with some light brown or pale green shades. This material has the appearance of having been deposited by thermal waters.

In the calcite on the west side of Cove Creek the carbonate-apatite occurrs as small white or brownish radiating crystals. In the writer's first collecting days at the Cove this material was confused with wollastonite and thomsonite, both of which are reported to occur in this area, but subsequent tests tend to show that all of the samples collected are carbonate-apatite.

Carbonate-apatite also occurs in the central portion of the Cove associated with nephelite, schorlomite, and melanite. This material is white, has a porcelaneous luster, and is intimately associated with fluor-apatite in long acicular crystals. Carbonate-apatite is reported to be associated with rutile in titanium mines.

CATAPLEIITE:—Reported to occur as an alteration product of eucolite.

CHALCEDONY:—Has been found sparingly at Calcite Hill in a highly weathered rock associated with carbonate-apatite The chalcedony is a dull white and gray, massive, and contains numerous vugs which are lined with microscopic quartz crystals. One or two of the vugs show a botryoidal surface to the chalcedony. It is believed that the chalcedony is a replacement or seam filling material.

CHLORITE:—Found at Calcite Hill as a second alteration after monticellite. The material occurs as an earthy dull green massive mineral or as a more vitreous green radiating mineral. An optical examination of the mineral indicates that it belongs to the chlorite group, probably prochlorite or amesite. A description of the occurrence is given under monticellite below.

DICKITE:—Reported to occur as an alteration product in the clays at the brookite prospect and associated with taeniolite.

DIOPSIDE:—Has been reported as occurring in several of the syenite rock types.

DOLOMITE:—Is found in white crystalline aggregates having the typical curved faces of dolomite. Some specimens have a coating of drusy quartz. The dolomite is found in the titanium mine, associated with rutile.

EPIDOTE:—Has been reported as occurring in felted masses coating large microcline crystals. A specimen of material in the writer's possession which answers the above description has been determined by optical analysis to be ægirite.

EUCOLITE:—Excellent specimens of eucolite, occurring as a yellow brown band surrounding eudialyte crystals, were found during excavation of the quarry at Calcite Hill. The eucolite was generally rounded and badly shattered; no crystals were found that were completely eucolite, as all had the central eudialyte core from which the eucolite is derived.

EUDIALYTE:—Occurs in the syenite rock as bright pink glassy masses. The eudialyte is in rounded grains, sometimes as large as one inch in diameter; crystal faces are not often found in the mineral as the grains usually fracture when the rock is broken. The companion mineral, yellow brown eucolite, occurs as an exterior band around the eudialyte as noted above. Good specimens of both minerals were found during excavation of the quarry at Calcite Hill. However, nearly all good specimens have been collected at this writing. The best present locality for eudialyte is on the Branch, a few hundred feet above its junction with Cove Creek. The boulders in which it is found are large and tough and it is difficult to secure adequate specimens. A large syenite boulder at the west end of Cove Creek bridge contains some eudialyte but efforts to break off specimens are generally unsuccessful.

FERBERITE(?):—A mineral, tentatively identified as ferberite by chemical analysis has been found in a thin lens in a drill hole at the molybdenite prospect. Further analysis is necessary to establish the identity of this mineral.

FLUORITE:—Occurrs in gray, fine-grained syenite rock on the west rim of of the Cove as small purple grains associated with pyrite. Also roported as occurring with sodalite in the south central portion of the Cove. The fluorite at Magnet Cove is said to have a yellowish green thermoluminescence.

GALENA:—One small cube of galena has been found in the igneous pegmatites at the junction of the Branch and Cove Creek. This is the only specimen of the mineral that the writer has heard of being reported from this locality.

GYPSUM:—A small amount of finely crystalline white gypsum has been found at Calcite Hill associated with vesuvianite, calcite, and schorlomite.

HACKMANITE:—Hackmanite was found in 1936 on the south border of the Cove by Joe W. Kimzey and Lawton Kimzey of Magnet. The mineral occurrs in irregular white or colorless masses associated with sodalite, pyrite, calcite, biotite, and fluorite in a dark green tinguaite dike. A second occurrence has been reported on the north side of the Cove. A small amount of hackmanite has also been found in a coarse grained gray syenite rock at Calcite Hill. The hackmanite fluoresces a golden yellow under the long wave ultraviolet light and rose under the short wave light. Some specimens show a faint pink evanescence which fades rapidly upon exposure to artificial light or sunlight.

HEMATITE:—Occurs in stains and encrustations the same as limonite, but is much less common. Has been found as a dull red coating on quartz from the center of the Cove. Small crystals and rosettes of hematite have been reported from the hillside just west of Perovskite Hill. At Tufa Hill, near the center of the Cove, hematite occurrs in a layered massive deposit in which are interspersed many radiating spherules of quartz crystals up to one sixteenth inch in size. The exact origin of this small deposit is not known, but appears to be the result of hydrothermal action.

HORNBLENDE:—Reported as occurring

in monchiquitic dike rock in the north central part of the Cove.

HYDROTITANITE-(anatase):—Is found intimately associated with columbian perovskite and is an alteration product of that mineral. The crystals are pseudomorphs after columbian perovskite and are distinguished by their light cream or brown color. Some specimens show only partial alteration resulting in crystals of mottled cream and black coloration. Crystals of hydrotitanite are found only sparingly at the present time.

ILMENITE:—Has been reported as a constituent of some of the syenite rocks. Also reported in dikes at the titanium mines, partly altered to leucoxene.

KAOLINITE:—Reported as an alteration product in some of the syenite rocks. Also reported from the titanium mines and from the brookite area.

LEUCOXENE:—Has been reported as occurring abundantly in the rutile and brookite areas as an alteration product of older titanium minerals; this material is earthy and yellow brown in color. Analyses have indicated that the leucoxene is composed of anatase. In the brookite area in the northeast corner of the Cove numerous specimens of dark smoky quartz have been found which contain needles of a light yellowish brown or white mineral. This mineral has been tentatively identified as leucoxene (anatase).

LIMONITE:—Occurrs generally throughout the Cove as brown stains or encrustations on rocks and minerals, usually the product of weathering of the substances containing iron.

Limonite pseudomorphs after pyrite crystals are found in the north central portions of the Cove in the vicinity of the titanium workings. The crystals have the general form of the rounded cube with striated faces typical of the pyrite cubes at this locality. They are found loose in the overburden. Color, dark brown with dull lustre.

Limonite pseudomorphs after magnetite are sometimes found in the residual soil in which the magnetite crystals are found. Although the surface appearance of these pseudomorphs is similar to the magnetite, they are distinguishable by their lower specific gravity, hardness, streak, and lack of magnetism.

MAGNETITE:—Irregular rounded masses up to several inches in size with shiny black color on fresh fracture; the exterior is usually dull brown or black. Some specimens show polarity and have the ability to pick up nails, paper clips, etc. Occurs in the surface soils in the central portion of the Cove.

Crystals—In well formed and distorted octahedrons up to three-fourths inch in size; some larger crystals have been found but they are rare. They are found embedded in calcite on the west side of Cove Creek and north of the highway. Loose crystals have weathered out into the residual soil above the calcite. Color, shiny black in the unweathered calcite, and dull black or brown in the loose crystals. Often contains small masses and stringers of carbonate-apatite included in the crystals. Reported as a constituent of most of the igneous rocks found at the Cove.

MANGANPECTOLITE:—Williams reports that tabular crystals of the mineral are to be found as a decomposition product in the eudialyte syenite. Pinkish white radiating masses found at Calcite Hill were first identified as manganpectolite because of their appearance and the prescence of manganese. It has since been shown that this material is probably a form of thomsonite.

MARCASITE:—This mineral, not reported previously from the Cove, has been found recently in the titanium workings and in the molybdenite deposit. At both localities the mineral occurs in irregular masses which appear to be made up of numerous radiating nodules joined together in botryoidal form; the structure of the mineral is best seen under a glass. Marcasite is associated with rutile, sphalerite, pyrite, and molybdenite.

MELANITE:—Considerable amounts of melanite garnet are found in the central part of the Cove south of the highway. The garnet is found in fragments, sometimes several inches in size, and with several well formed faces, but few complete crystals have been found. The color is

black or rarely a deep red. Broken crystal fragments show a banded structure as if the mineral originally crystallized in layers. Many specimens of the melanite are found shot through with white or brown stringers of carbonate-apatite and fluor-apatite. Melanite is reported to be a constituent of several of the igneous rock types found at the Cove.

MELANTERITE:—This mineral has been found as white encrustations on pyrite at the titanium pit. This probably represents a recent formation of the mineral as the mine has been idle for several years and the melanterite was found on pyrite in open cuts in which water was standing.

MICROCLINE:—Constitutes the groundmass of the aegirite-bearing rock near the Cove Creek bridge. It occurs in large white masses.

MOLYBDENITE:—This mineral is found along Cove Creek in the northeast corner of the Cove. It occurs in irregular crystalline masses and disseminated through the surrounding rock. No large crystal plates are found. Pyrite, marcasite, rutile, brookite, albite, and some smoky quartz are also found in this location. Small seams of molybdenite have been noticed cutting the calcite at Cove Creek bridge; however, this occurrence appears to be very limited.

MONTICELLITE:—Occurs in light to dark brown rounded grains (up to an inch or more in size) disseminated throughout the calcite near the Cove Creek bridge. Several years ago the excavation of a test pit on Calcite Hill produced good specimens of unweathered material. Subsequent excavation of the area revealed large quantities of excellent specimens. When the water in Cove Creek is low, good monticellite may be secured from the creek bed just above the bridge. Specimens with good crystal faces are rare; however, a few crystals have been found recently. The monticellite has been found to alter to radiated green and reddish tremolite, which in turn alters to a mineral of the chlorite group, either as green radiations or as earthy masses. As some specimens have been found in which no tremolite is visible but the monticellite is surrounded by chlorite, it is possible that alteration from monticellite to chlorite may take place without the intermediate tremolite formation.

NATROLITE:—Occurs profusely in the contact metamorphic area at Calcite Hill. White radiating masses up to six inches in size have been found, although the crystals are commonly somewhat smaller. A common mode of occurrence in a vug or a seam is for the natrolite to be coarse bladed, white, and opaque adjacent to the rock wall. On top of the opaque material are smaller, colorless, terminated crystals of natrolite intermixed with slender black aegirite prisms. In some instances the natrolite assumes a silky texture and has a pinkish tinge. A few specimens have been found in which colorless crystals of thomsonite (?) are on the white natrolite blades; on other specimens thomsonite and natrolite appear to be intermixed, both materials being white, bladed aggregates. Considerably more work needs to be done on these associations to positively identify the minerals involved as their visual appearances are almost identical.

NEPHELITE (variety elaeolite):—This mineral occurs in several of the rock types found in the Cove. The nephelite is generally found as large irregular masses salmon, smoky, or greenish in color. Near the center of the Cove in the garnet field the salmon colored nephelite has weathered out into rounded pebbles, often with a white encrustation on the surface. Some of these pebbles undergo an interesting transformation upon weathering. The surface often becomes covered with spangles showing a sparkling display of color in reds, greens and yellow. These sparkling stones are known as "sun stones". Unfortunately, attempts to cut and polish these stones have not been successful.

OLIVINE:—Reported to be an important constituent in a monchiquitic dike rock in the north central part of the Cove.

OPAL:—The variety geyserite is reported to occur as a gray siliceous material in the molybdenite prospect.

ORTHOCLASE:—Is reported from the west side of the Cove in fairly large gray crystals; the writer has not secured any specimens from this locality. A second occurrence of orthoclase is as an important constituent of the pseudoleucite crystals, in which the orthoclase crystals are white, radiating forms.

PEROVSKITE:—Dysanalyte, or columbian perovskite, as listed in the new 7th edition of Dana's *System of Mineralogy*, is one of the rare minerals which has given Magnet Cove its prominent position in the field of mineral collecting. The mineral is found on the west side of Cove Creek and north and south of the highway. It occurs scattered in the calcite and weathered out into the overburden soil as crystals ¼ to ½ inch in size. The crystals are shiny black cubo-octahedrons with extremely small cubic faces; rarely do cubic forms occur. The crystals are best distinguished from the associated magnetite octahedrons by the presence of the minute cubic faces and the lack of magnetism. The columbian perovskite alters into hydrotitanite by weathering.

PHLOGOPITE:—Reported as occurring in small flakes in the contact between the calcite and adjacent dike rock, near the Cove Creek highway bridge.

PLAGIOCLASE:—Reported as occurring in monchiquitic dike rock in the north central part of the Cove.

PROTOVERMICULITE:—This white, opaque mineral is found in the central part of the Cove as an alteration product of green biotite. It occurs in plates up to several inches in size; the plates are semi-flexible and have a silky lustre. Protovermiculite weathers out in the overburden soils and is not found in the parent rock.

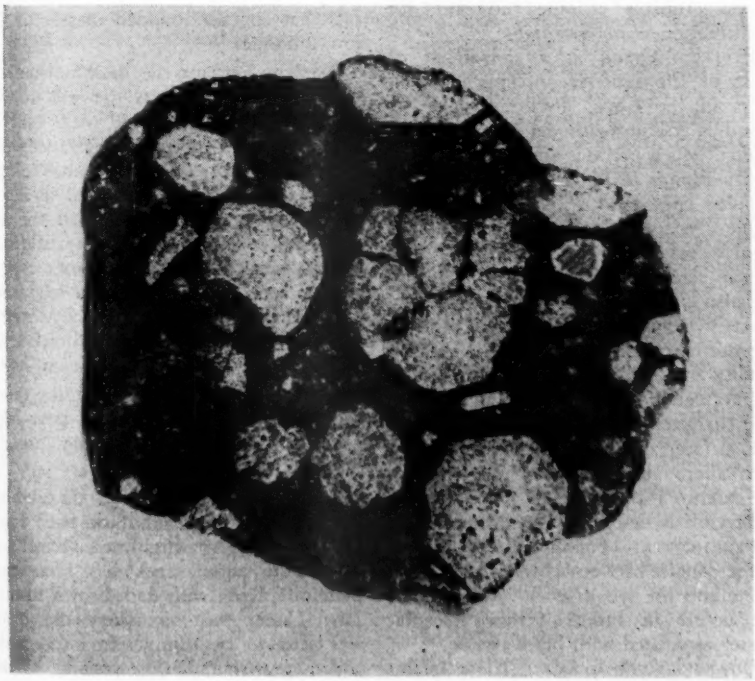

Fig. 2. Sawed slab of leucite syenite from Magnet Cove, Ark.

PSEUDOLEUCITE:—Occurs in the western, southern, and southeastern parts of the Cove, south of the highway, as light gray or white trapezohedrons in the dark gray ground mass of the syenite rock. Figure 2 shows a section of leucite-syenite rock in which the pseudoleucite crystals are readily apparent. The small lath shaped crystal is orthoclase. On a road leading south, exposures of the pseudoleucite-bearing rock are highly weathered and the loose crystals may be found along the road ditches. The weathering is so severe, however, that well formed crystals are difficult to find. It is reported that the pseudoleucite is composed of small radiating crystals of orthoclase and nephelite and some pyroxene inclusions.

PTILOLITE (?):—Occurs in extremely fine silky, white masses in a vug in a rock composed chiefly of vesuvianite and some schorlomite, at Calcite Hill. An optical examination of the mineral indicated that it was probably ptilolite; however, the identification is not positive.

PYRITE:—Found as a constituent of most of the igneous and metamorphic rocks in the Cove. Pyrite is generally found in the unweathered rocks as small grains. Much pyrite is found in the titanium workings in the form of cubes with rounded edges and deeply striated faces; single crystals, crystal aggregates, and irregular masses are common. Crystals vary in size from ¼ inch to 1 inch. Pyrite also is found in crystalline masses intimately associated with molybdenite in the northern part of the Cove. At this locality some of the pyrite crystals have a gray metallic sheen; this is only a surface characteristic, however. In the residual surface soils the pyrite crystals have been altered to limonite while retaining the exterior form of the pyrite cubes; this occurrence is described under limonite.

PYRRHOTITE:—Found at Calcite Hill in the contact between coarsely crystalline calcite and the syenite rock. The pyrrhotite occurs in bronze yellow irregular masses associated with black biotite.

QUARTZ - *Rock Crystal*:—Clear quartz crystal is rather uncommon at Magnet Cove. One specimen found was in the form of a vug which had weathered out into the residual soil in the center of the Cove. The vug was about a foot in diameter and had an extremely rough exterior, apparently caused by growth on calcite rhombs which were subsequently leached away. The interior of the vug consisted of quartz crystals of slightly amethystine tinge growing toward the hollow interior.

A similar specimen on a much smaller scale (1 inch) was found at the titanium mine. A thin drusy coating of pinkish quartz had coated calcite rhombs. The calcite had been leached down leaving a free space of about ⅛ inch between the quartz and calcite.

At Tufa Hill near the center of the Cove a layered hematite rock contains tiny spherules of what appears to be yellow quartz. Examination under the microscope shows the spherules to be composed of radiating clear quartz crystals that contain rounded masses of yellow limonite.

Smoky—Perhaps the most outstanding occurrence of quartz is the well-formed smoky crystals having a white surface with a peculiar mottled appearance. The crystals are very dark, at times almost black, and range up to several inches in size. The quartz is found on the east side of the Cove and is quite often associated with brookite. Some crystals contain long slender needles of leucoxene. Small double terminated smoky crystals are found sparingly in the molybdenite workings.

Milky—Rough crystals of milky quartz containing brookite are found near Magnet Post Office although they are not common.

Impure—Some very dark, almost black quartz crystal fragments have been found at Calcite Hill in a highly weathered zone where the parent rock has been completely replaced with dark brown to black soil. Under the microscope the quartz was seen to be completely impregnated with a grayish radiating mineral, as well as with some darker particles. It is not known what the inclusions are.

RUTILE:—Rutile is one of the most common minerals at Magnet Cove, occurring in crystals and crystal fragments throughout the surface soil in the central and north central areas. At the titanium workings, excavation has been carried below the dark brown surface soils and the rutile is found in a highly weathered light colored rock, associated with pyrite, albite, and calcite.

The rutile crystals and fragments are typically black or steel gray in color with brilliant sub-metallic lustre; they are generally striated with characteristic vertical furrows. Single crystals and the famous sixlings and eightlings are rare; the best specimens of the latter the writer has seen are in museums. Infrequently, small crystals and crystal fragments of deep brownish red rutile are found, but they do not have the characteristic form of the mineral generally to be found here. One small crystal in the writer's possession is nearly cubic in shape, deep red in color, and has a metallic adamantine lustre.

Paramorphs after Brookite:—In the vicinity of the titanium workings, well formed crystals of rutile paramorphs after brookite up to an inch in size are found. They have the gray color, brilliant lustre, and striations characteristic of the rutile, while the crystal form is that of brookite.

Dull, irregular masses of rutile, having the appearance of water worn crystals are frequently found in the surface soils, especially on Perovskite Hill. It is probable that these crystals are weathered or altered forms of the rutile paramorphs.

SCHORLOMITE:—Schorlomite is found in black irregular masses in rock in the western part of the Cove, and weathered out into the top-soil. The masses are usually small and have no apparent structure. Schorlomite is best distinguished from the black melanite by the absence of the banded structure common in the latter mineral. It is reported that schorlomite and melanite are frequently intergrown, thus making positive identification difficult. Garnet associated with vesuvianite at Calcite Hill and found after recent excavations is believed to be schorlomite.

SODALITE:—The Diamond Jo quarry on the south side of the Cove, abandoned for many years, furnished a gray nephelite syenite stone for building and ornamental purposes. It is interesting to the present day mineralogist for the seams of sodalite which cut through the rock of the quarry. The material is bright blue in color, but is not over 1/8 inch thick. Diligent searching and a little careful chipping will yield the collector nice specimens of this material.

Other occurrences of sodalite are in the south central and northern parts of the Cove in a greenish tinguaite. The sodalite is blue and occurs in irregular masses associated with hackmanite. The sodalite is reported to contain pyrite, calcite, black biotite, and fluorite. The sodalite fluoresces a violet red.

SPHALERITE:—Sphalerite has been identified as occurring sparingly in the titanium mine area. It is found in light colored rock (decomposed) as stringers of shiny, metallic, nearly black flakes. Very little of this material has been found, but specimens are quite attractive. Marcasite recently found in this area has been found to include some small crystals of sphalerite of the reddish brown color known as "rosin jack". Green sphalerite has also been reported as having been found in a vug on felted brown acmite with orthoclase. Although the location was not given , the association is that which is common in the vicinity of Calcite Hill.

TAENIOLITE:—Silky aggregates composed of small yellowish white flakes of this mineral have been found in the recent excavations for brookite in the northeast corner of the Cove. The original locality has been filled in and no more taeniolite is available at the present time, however.

TALC:—Found in small foliated plates, pinkish in color, at the Calcite Hill in the contact between the calcite and the syenite dike rock.

THAUMASITE:—A small amount of this mineral was found in the contact metamorphic zone at Calcite Hill. The thau-

masite is white, massive, and relatively opaque.

THOMSONITE:—Found in the center of the Cove as white massive material having a bladed semi-crystalline appearance, associated with schorlomite and some natrolite. Thomsonite is also found in the contact metamorphic area at Calcite Hill in a variety of forms. It occurs as colorless needles on natrolite, and as silky pinkish white radiating masses with vesuvianite and schorlomite. In the latter occurrence the thomsonite resembles pectolite in appearance. Chemical analyses showed it to contain manganese. More work needs to be done to completely identify the thomsonite and related minerals.

TITANITE:—Has been found sparingly in the coarse-grained eudialyte syenite rock at Calcite Hill. The titanite occurs as elongated prismatic crystals (1 inch or more in length), dark brown in color, with a glassy interior and dull exterior. Titanite has been reported as occurring in small yellow crystals in several of the various types of syenite rocks. Also reported in dikes at the titanium mines, partly altered to leucoxene.

TREMOLITE:—This mineral has been found recently at Calcite Hill as an alteration of monticellite. The tremolite occurs as a radiating green and reddish colored crystalline aggregates in a band about ¼ inch wide surrounding the monticellite crystals. The tremolite apparently alters into a mineral of the chlorite series.

VESUVIANITE:—Weathers out of the calcite in yellow-green crystal fragments having a peculiar mottled appearance and often showing numerous small pits on the crystal faces. Complete crystals are seldom found, but the fragments may range up to several inches in size. Vesuvianite is exposed in the road cut at Cove Creek bridge and in the roadside ditches to the east of this point. Recent excavations on Calcite Hill have brought to light specimens of unweathered vesuvianite that are a dark brown to green in color, with excellent crystal faces. There are often several shades of color within the same crystal. Large patches of metamorphic rock in the hill show a characteristic green color of vesuvianite; examination of this rock under the microscope shows it to be composed of minute crystals of vesuvianite, quite perfect in form, but seldom over 2 mm in size. It is in this rock that some of the excellent specimens of thomsonite, schorlomite, and other minerals have been found.

WOLLASTONITE:—Occurs in the contact between pegmatite dike rock and the calcite, near Cove Creek bridge. The wollastonite is in relatively clear crystalline masses, sometimes showing terminations, but more often appearing as an irregular mass in the rock. It is recognized by the perfect cleavage face which presents a parallel bladed appearance and has a pearly lustre. The wollastonite also has a delicate pink fluorescence under the short wave ultraviolet light.

Other Minerals

A survey of various "check lists" of Magnet Cove minerals which have been presented in other publications shows the following list of minerals, besides the ones discussed in the preceding paragraphs, as occurring at this locality: Actinolite, alamandite garnet, allophane, aluminite, ankerite, braunite, cordierite, grossularite garnet, hypersthene, muscovite, ochre, oligoclase (sunstone), quartz (aventurine), variscite, wavellite, and xanthophyllite. The writer has not been able to find any of the aforementioned species nor has he been able to trace down the original reports of their occurrence in the available literature. A review of the list shows that certain of the minerals could readily occur in the associations present at Magnet Cove and it is highly probable that specimens of them have been found. Other minerals on the list, however, do not appear to be of the type one would expect to find at this locality and their reported occurrence is doubtful.

Acknowledgements

The writer wishes to acknowledge the assistance and cooperation of Messers. J. W. Kimzey of Magnet, Harold B. Foxhall State Geologist of Arkansas, and the late Lewis B. Pringle of Little Rock in furnishing data and localities on many of

the minerals reported herein. Appreciation is also expressed to Dr. John Totter of Little Rock for chemical analyses of specimens and to Mr. Louis Moyd of Bancroft, Ontario, for optical identification.

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BRACHIOPODS ON—HUDSON

By SANDY T. RODGERS

15 DeLaval Place, Poughkeepsie, N. Y.

First of all my sincere thanks go to A. S. Warthin Jr., Professor of Geology at Vassar College, for informing me about the source that I base this article on. After having gone to him for help, he told me about this fossil occurrence. Soon afterwards I planned a trip there, executed the plan, and here is what happened.

Following Manchester Road out of the City of Poughkeepsie I soon came to Vassar View Road, overlooking the Vassar College campus. On this road I perceived an excavation, apparently a section of exposed shale, made so when the road was constructed. Upon examining small holes and cavities in the excavation I found small specimens of shell fossil familiar to us as brachiopods. The fossils were easily distinguished since they were tinted a dark brown against the light-colored shale.

Certain specimens disclosed small, irregular markings resembling the borings of prehistoric worms. After being shown to other collectors, we all came to the conclusion that they were this type of borings.

The largest and best specimen I found in the area took at least half an hour to secure from its matrix. Pulling away a large layer of the shale, I found the fossil suspended in a delicately thin slab in the roof of one of the myriad small cavities. After patient minutes of chiseling it finally loosened and fell on the cushion I had prepared for it out of my field bag full of tissue paper.

I have planned a few more trips out there this summer, possibly with any collector friends passing through. I also hope to experiment further with the curious markings previously mentioned, since the solution to them is not yet positively known to me.

Editor's Note: We hope you like this little article, whose author is only 12 years old. Sandy is keenly interested in minerals and is a member of the R.&M.A. In Poughkeepsie, a city on the east bank of the Hudson River, is Vassar College, a famous institution of higher learning for women.

A SAPPHIRE AND GARNET OCCURRENCE

By GUY B. ELLERMEIER
1060 So. Gilpin St., Denver 9, Colo.

That sapphire and essonite garnet occurred in contact ledges near Turret, Colorado, had been a legend for more than fifty years. Many of our local collectors averred that sapphires were to be found near Turret, but no one was able to describe the locus more definitely than just "near". A report by our State Bureau of Mines in 1887 furnished the basis for the legend. During that year a prospector named Nate Wanemaker, while combing the region for magnetite, discovered the outcrop in which occurred blue corundum and cinnamon-colored garnets. That was the same Nate who later discovered the famous aquamarine and phenacite deposits near the summit of Mt. Antero.

Evidently Mr. Wanemaker thought the corundum deposit might have commercial possibilities for use as an abrasive, and it seems probable that he requested a member of the Bureau of Mines to examine the ledge. In any event, a Bureau of Mines man did go to the locality, and later he made a brief report of the occurrence. But nothing further seems to have been done about the find other than a considerable amount of prospect work.

During July, 1947, the writer in company with Wendel Mohr and Fred and John Meissner, went to the Turret locality. It was our intention to camp there and prospect the region until we rediscovered the corundum ledge. We had made a short visit there the previous year; meanwhile we had given some study to the geology of the region, and felt that we might limit our search to that section of the region where metamorphism appeared of greatest intensity. Thus in due course of time we did discover the deposits, and the legend became an established fact.

As near as we could determine, the corundum ledge extends up the mountain side for a distance of eight or nine hundred feet, with outcroppings occurring at frequent intervals. The strike is northerly with an easterly dip of about 30°. The sapphire crystals occur in a corundum-schist varying in color from a light bluish-gray to a gray tinted with brown. The corundum-schist ledge is about one foot wide, and is overlaid by a greenish igneous rock. Underlying the corundum-schist, and in contact therewith, is a ledge perhaps from six to eight feet wide of a metamorphosed limestone, brown in color. The latter carries the essonite garnets. In places the metamorphosed limestone appears to be a massive garnet rock imperfectly crystallized.

The sapphire crystals thickly speckle the corundum-schist, and are in the habit of thin tablets from 1 mm up to, rarely, 5 mm in diameter. In reality the sapphires are thin tabular crystals of rhombohedral form, showing roughly the first order rhombohedron and base. The blue tablets on a gray matrix make interesting specimens.

The garnets thus far examined are all perimorphs, the brilliant outer crusts enclosing successive layers symetrically arranged with reference to the external form of the crystal. A cross section of a large crystal shows the lines of internal structure quite plainly. The size varies from 1 mm up to, occasionally, 25 mm in diameter. The color ranges from yellow, in tiny crystals, through cinnamon-color to a deep black. At least some are grossularite, variety essonite, though in the writer's opinion they grade into andradite, in the nearly black colors. Such a gradation may well be expected since magnetite is an accompanying mineral, and ferrous iron may replace a part of the calcium. All are opaque.

Other associated minerals are epidote in small crystals, and two unidentified minerals in crystal form. The one is green, probably diopside; the other is white, and may be sillimanite. We put in a few shots, but found both the corundum-schist and the garnet rock discouragingly hard. The drilling of a single thirty inch hole was sufficient to dull a drill be-

(*Continued on page 522*)

RAMBLES IN A COLLECTOR'S PARADISE

By HORACE W. SLOCUM
320 Charlotte Ave., Rock Hill, S. C.

The last article which I wrote was mildly criticized by a brother collector as being, "long winded." So for the benefit of those readers who are irked by the inclusion of the writer's theories, questions and detailed accounts, let me warn you at the start that this monograph will be even worse than the former in the matter of verbage.

That it is written in the first person singular may need a note of explanation also. But considering that these experiences were personal, the relating of them in any form except the above, would reduce the pleasure of writing them from a labor of love to the hard work of finding the proper phrases in which to set them down.

So I shall be long winded, knowing full well that the Editor will eliminate what he believes to be unnecessary; and ask questions, because I need the answers to them to settle a dispute in my own mind. Will give also such minute detail as I can; with the hope that the search of any who use these notes for discovery purposes may be eased and directed. Thereby, saving for collecting the much valuable time it was necessary for me to squander in order to find the locations in the first place.

The title has been chosen to approximate another far greater work written nearly fifty years ago. I refer to W. S. Valiant's "A Collector's Paradise," published in the *Mineral Collector* from March to April in 1899. In as much as the title is similar, the circumstances of its writing are similar also. For Valiant, as I understand it, visited St. Lawrence Co., N. Y., some time in the late 1860's or early 1870's. He waited some 25 years thereafter to put his experiences on paper. In my case I have waited only a scant 9 or 10. In both cases however, the long absence has resulted in dimming the bright edges of memory of distance and locality, to such an extent that I never found Valiant's article of any help what so ever in actually locating a prospect. So can only hope that the long wait has not lessened my ability to give explicit directions.

To explain the reason for this protracted delay in writing these notes it becomes necessary for me to make the following inane statement. I had always hoped, dreamed and schemed to return to these wonderfull collecting places and find them just as I had left them. Wanted to go back and collect again; without finding the locations torn up and despoiled as I found the Pierrepont black tourmaline locality after it had been dug by 24 or was it 26 collectors who descended on it in force and left it with all the appearance of a plowed field. More of that later. Nine years of wishing and dreaming however, and I awake to the cold hard facts. I'll never return. Never be financially able to make the trip, nor have the time to do so even tho the money were available. Why therefore be a dog in the manger? Did I not have one whole summer's enjoyment? Should it be denied others just because I hate to think of the places being cleaned up? Moreover should not these famous spots be accurately enumerated, never to be "lost" again?

Others had been there and written, yes. William M. Agar's notes (The minerals of St. Lawrence County, *American Mineralogist,* October and November, 1921.) had been of the greatest help to me. But even with his notes to help, some of the places took a good half day to discover. Which left too short a time for collecting. A more comprehensive and detailed account will, I hope, save this time; so that it may be used by others for collecting and observation. Many collectors and would-be collectors have been to northern New York. I have perused what they have written with interest and trepidation. Only one however gave me cause to worry. Keith R. Dahlburg in his article, "A Check Up of the Localities

of The Hammond Quadrangle", (*Rocks and Minerals,* Aug. 1947) seems to have hit several of the high spots. His locality No. 4, north of Oxbow, is one of my favorite locations. Number 7, Nature's Maze, one that I hunted for long hours and finally found. Number 10, the Reese Farm, was another that for long intrigued me. After a long almost futile search I found it. A number of his other places too, I know. But the specimens found at these latter are hardly worth wasting your time to hunt. I can't quite decide from Mr. Dahlburg's article whether he found the minerals listed as being at these places, or whether he notes them from other sources as having been found there. In any case his is the most thoro of the articles recently printed and can be of great help to other collectors.

All of which is most horribly, "long winded," as my brother collector suggests. However one does not build a house without first laying a foundation, and the foregoing must be considered as such. Upon it I will try to build my story.

DIAMOND HILL, SALISBURY, N. Y.

This locality will have to be given without benefit of even a topographical map. In fact I only write about it because so many collectors like myself go to Middleville after quartz crystals, only to be discouraged and return home empty handed. Mr. Zodac finally found a couple (*Rocks and Minerals,* Jan. 1937, page 5) when he broke open a rock near the brook bed. At my first visit in 1936 a few small crystals were scattered around. But later longer visits produced only one ½" crystal tucked away beneath a stone wall. Now right here is where I want to ask a question. Why, when for countless ages that little stream has tumbled over the crystal-bearing ledges, is there no concentration of crystals in the stream sands? It would seem only natural that there should be. For the ledges must have released the crystals in numbers. But I leave it to every collector who has searched the vicinity, to tell you that the Herkimer "diamonds" are just not there. So see Middleville if you must, if it's on your way, but do not be disappointed if you find no crystals. Leaving Middleville on route 29 and proceeding east toward Salisbury you go thru a road cut just beyond the town. I have found a few tiny crystals in the road gutters here, but they were certainly nothing to brag about.

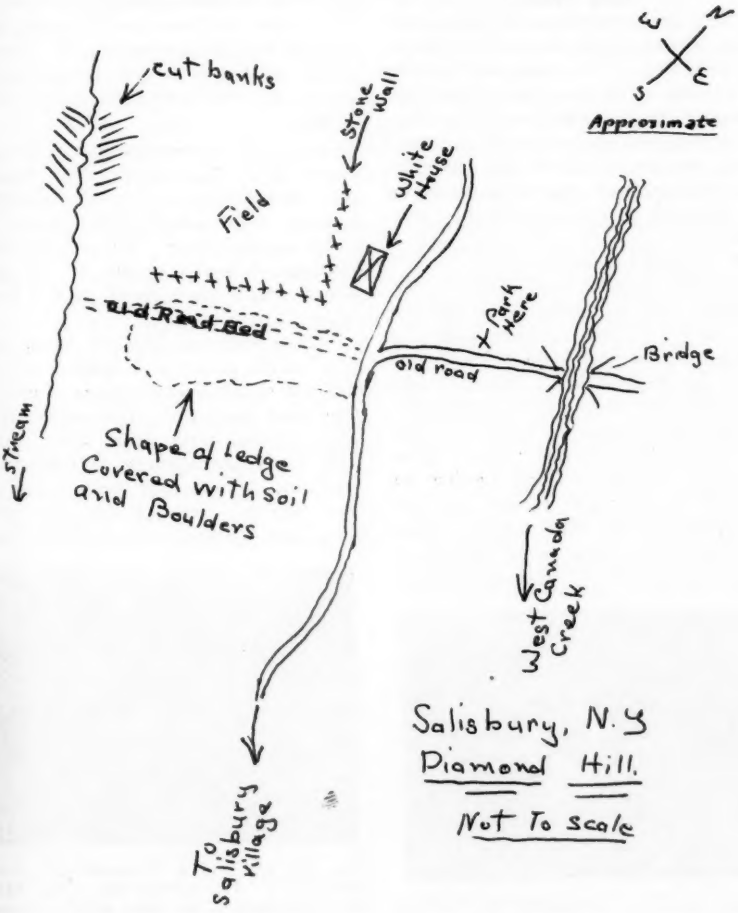
When you come into Salisbury you must enquire for Diamond Hill. It is well known locally. It is not over a mile from the town and there are no confusing intersections or Y's to navigate. The map, while not to scale will give you most of the particulars. Park your car beside West Canada Creek across the road from the white house. Cross the road and face the house. To the left of the house as you face it will be seen a grown up, old road bed. About 100 to 150 yards along this old road and just beyond the house, boulders of limestone will be noticed appearing thru the soil. These are the detritus of the ledge beneath. The procedure here is to dig around the

The Middleville, N. Y., "diamond" location.

Middleville, N. Y., "diamond" location. The brook spoken of in the text crosses the road just around the curve.

boulders, sifting each handfull of dirt taken out. Crystals of quartz up to 1" in length will be found in this way. *Not* by the handful. But an hour's digging should produce 25 at least. They will not all be 1" long, don't mistake my words; but several of them should be. You will notice as you follow the ledge in a westerly direction that at its further end a small stream flows from the field on the right. About 200 or more yards up thru the field the stream has cut its way down thru the ledges and soil to a depth of 15 to 20 feet. It is usual to suppose that there would be a concentration of crystals in this stream bed. This is not so. I have dug a few from the top of the banks; but search as I might none were found at the bottom of the cut or in the brook.

At my first visit in 1936 I found some large crystals which I suppose had weathered out of some rocks at the base of the stone wall which parallels the old road. But on my last visit in 1938 we found none along this wall and had to dig like woodchucks to get a handful or more of the smaller sparklers.



So I give you Diamond Hill. Practically unknown in present day writings. A source, where, if you are a true collector and unafraid of digging in the dirt you may gather Herkimer "diamonds". One note of caution in addition—if you go there in May take along a supply of fly dope, for the black flies can make your trip a miserable one, causing you to gain many black marks in the Record Keeper's books; by reason of inappropriate language. Or is it inappropriate? I'll leave you to judge.

TABULAR QUARTZ AT PORT LEYDEN, NEW YORK

It will be necessary at the beginning of our second ramble to quote a page or two from Valiant. You may wonder why the allusion to the iron mines when the chapter is headed tabular quartz. Further reading will show why this was necessary. Anyway I believe few collectors are acquainted with these iron mines, or the splendid garnets which they produced.

Mr. Valiant—Quote.

"The Port Leyden iron mine was full of water, and the mine debris inaccessible; so we left that country with such experience as we had collected and took a train for Trenton Falls. James E. Borden's "Curiosity Shop", at the latter place, was an easier quarry to collect at than any of the places we had visited. What we could not get at Port Leyden we collected at his store; garnets and tabular quartz. The Port Leyden mines and the iron furnaces were abandoned because the ore was so Mephitic it would not make good iron; but the mine yielded the nicest garnets I ever saw. Mr. Borden secured a large quantity of the garnets and tabular quartz; and the other dealers "got left". The garnets ranged in size from a grape to the largest pomegranite; color and form same as the Alaska garnets, but the rhombic faces were different. Each face of these rhombic dodecahedrons was built up of successive plates, just like Fig. 7 in Dana's large Mineralogy.

"One specimen, a single crystal, sat nicely in a base of magnetite and pyrite, the entire specimen weighing ten pounds. The garnet was loose in the matrix, and weighed just three pounds. Mr. Borden offered this at $1.00 per pound for the garnet; the base thrown in. It was taken quickly.

"As usual we stayed with Mr. Borden several days. After supper Mrs. Borden gave me a package as a gresent (another as usual) which was not to be opened until we reached home. We can tell now, however; it was a cluster of the same garnets, much like a bunch of very large grapes.

"These were not like the Salida garnets, rough, grainy and opaque, or covered out of sight with a green shell, but were clean sharp and bright colored crystals; cleaving easily from their matrix with rarely any damage to the crystal. Very few cabinets have them to-day except, perhaps, some of the old collections, with "Things now unobtainable".

Hunting Herkimer "diamonds" in the field at Salisbury, N. Y.

The old road bed at Diamond Hill, Salisbury, N. Y. This picture was taken facing the main road. The stone wall is to your left.

"Fill a barrel with broken glass of all sizes; let them go as they please, except that no two pieces shall lay parallel. Acute and obtruse angled cavities of all sizes and conditions will result. Coat all the pieces of glass with drusy crystals on both sides, thus making a mass of grotella. Fill some of these full of milk-white rock candy; others, leave partially filled showing crystal faces. Then go to Port Leyden, Lewis Co., N. Y., and get some of the tabular quartz including some with calcites; put them in a cabinet side by side, then ask your friends which is which. Even a Bates could not tell—a half mile off.

"The Beck collection shows a very poor sample of this, undoubtly from the outcrop, for the mine was not opened until a dozen or more years after he died. He never saw the garnets, for they were deep down in the magnetite and never outcropped.

"Those old things we used to see are told of so much and seen nowhere, now. We are often laughed at as "visionary or worse". No such things ever existed, for if they had I would have seen them is a common saying."—End quote—Valiant.

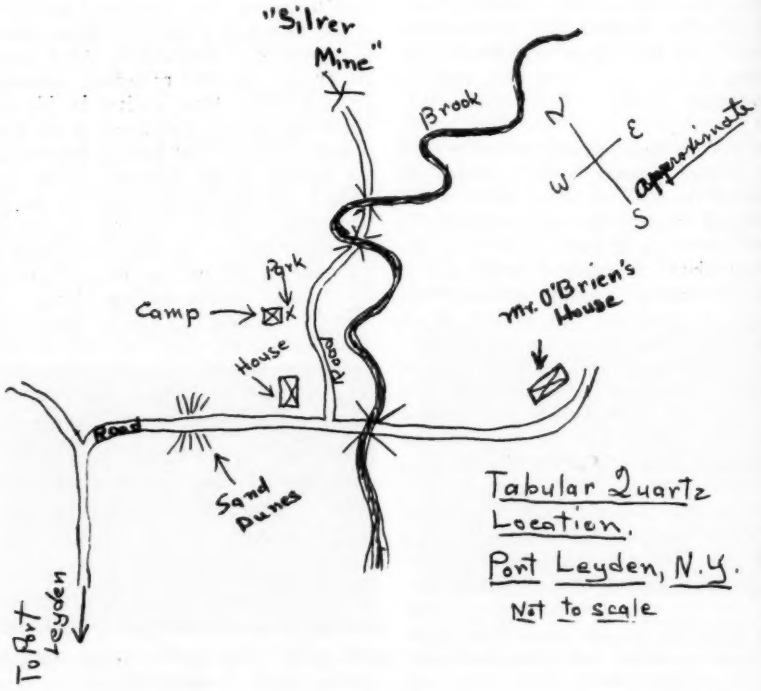
It was the thought that one or two of the smaller garnets might perhaps be found at the old iron mine dumps which prompted me to make the trip on July 4, 1938. Arriving at Port Leyden and enquiring about the mine I found that it was well known. A couple of small boys offered to guide me and we set off on foot. They took me to the old furnaces which are situated near the river and are northeast of the town. While there were no dump piles here the sight of the furnaces was particularly interesting. They were huge stone affairs reaching perhaps 40 - 50 feet high. When one considers the year they were built and what crude tools and devices were available at that time one is apt to wonder about the "giants in those days". Even so the furnace was not what I wanted to see. The boys were not so sure about the dumps, but when I explained they would be near large holes filled with water, they took me back toward the village and there in a deep wooded place were the old shafts and a very much overgrown dump pile. The Diary says I got several good specimens of garnet from these dumps. But they could not have been as spectacular as what Valiant wrote about. For I do not remember them at all; and like all of my collection (over 1600 specimens) they have been packed away in boxes these many years. Lack of space has ever prohibited the exhibition of the collection. Sometimes I get discouraged of ever collecting any more. For what I collect is promptly labeled, wrapped, booked, packed and stored—30 boxes of them now. Half stored in New Hampshire half with me here. I fear I'll never have the means or the space to unwrap them, put on proper labels and lay them out in cases or on shelves, so that other collectors and myself may often have the pleasure of examining them.

None of which says anything about the tabular quartz. And I confess I had never at this time seen a piece of tabular quartz to now what it looked like. All I had to go by on was the preceding quotation from Valiant. Now Valiant by his own admission did not gain access to the mine dumps. So what led him to believe that the tabular quartz occurred at the iron mine I can only guess. One can not interpret his notes in any other way except to believe that he thought it occurred at the mine. I did not see any evidence of the tabular quartz on the dump. Of course I was watching for it. Thus I felt upon leaving the iron mine not too well repaid for the long trip. The boys from time to time during the morning had mentioned a "silver mine" of which they had heard. But where it was, and any more then it was "just a silver mine" they could not tell me. I was not particularly interested in silver mines. Most always they turn out to be prospect holes in a barren quartz ledge. Or contain at best a sparse sprinkling of galena. Still with a half day ahead and no other locations handy I made enquiry in town

and was given information as to where the owner of the mine lived and general directions as to where the mine was located.

I suppose it is like crying over spilt milk to regret that in my earlier collecting days I did not sketch-map new locations. In any case the regret now becomes an embarrassment. For here I am in the act of giving information about a locality without the ability to give concise directions as to distances; nor more than general directions as to compass points. The Diary advises that it was some distance out of town. Memory tells me that we went east across a bridge from Port Leyden. At the next cross road or Y we bore right along the base of a low ridge which lay on our left. One thing I remember well,; at one place the road crossed a 200 yard stretch of sand dunes. Just what sand dunes are doing in this part of New York State I must leave for some geologist to tell you. But I can well advise not to get into that stretch of road when some other car is coming. For there'd be only one remedy—you'd have to exchange cars. Once out of these wheel tracks and you'd bog down to the top of your fenders. Once started thru, keep going, if you falter all is lost. I've bumped my axle on many a New England rock, and dragged the crank case thru much Carolina mud. But nothing in the way of roads ever made me perspire like this one. After you are thru, the road is passible for the rest of the journey.

The man to find was, at that time a Mr. O'Brien. His house is on the left of the road and not far beyond a bridge over a pretty brook. Take note of the brook as well as a house that faces it just before you reach the bridge. A road leads off left between the house and the brook.



The "silver mine", northeast of Port Leyden, N. Y., where the tabular quartz is found.

One of the old furnaces near the iron mines, Port Leyden, N. Y.

When you have permission to visit the mine you will drive up this road about ½ mile and park your car in front of a small camp. Continue on the road from here on foot as the road ahead is impassible to cars. You will cross the brook twice on old bridges and in the distance of approximately a mile the road will lead you right into the mine.

Let me quote from the Diary. —Drove the car up a woods road about half a mile to a camp and continued on foot for a mile more following one of the prettiest trout streams I have ever seen. Crossed it twice on bridges and came right into the mine. I cannot see where there was ever silver in the mine, but of the tabular quartz spoken of by Valiant there was an abundance. In fact it was hard to pick out the pieces wanted where there was so much to choose from. Calcite crystals were there in quantity and I collected one or two unknown specimens. The vein seems to be thru a ledge of tabular quartz in which vugs of calcite crystals occur. I wish I might spend a day on these dumps and not just the few hours which I had left.

Thus it would seem that Valiant's tabular quartz did not come from the iron mine but from this "silver mine". The fact that I found no tabular quartz in the iron mine dump is, of course, no proof. Well, do we need proof? We have a good source of this unusual mineral from Port Leyden, so who cares where it comes from—iron mine or silver? In fifteen years of collecting I have only seen tabular quartz from three locations. Here at Port Leyden, Baker's Mt., N. C., and one specimen labeled Lexington, S. C. The latter place is under water now, so I am told. Thus we have a variety which is comparatively rare. But few collectors seem to prize it, for if you offer it for sale there are no takers, and if you offer it for exchange there are very few.

As a last word—here is another "lost" locality—I wish you pleasure collecting here.

(*To be continued*)

Argonaut Mine Abandoned

The Argonaut gold mine at Jackson, Calif., idle since March 1942, has been formally abandoned. The Argonaut Mining Co., Ltd., of San Francisco was dissolved as of Feb. 16, 1948, thus ending one of the most important and successful deep mining operations on the Mother Lode. The property covers 4800 ft. along the lode. The collar of the Argonaut shaft is about 1500 ft. above sea level, and the deepest level, the 6300, is about 5570 ft. vertically lower. Over 8 miles of drifts, crosscuts, and tunnels were opened; over 4 miles of raises were driven; and 50 miles of stope floors excavated. The total production of the Argonaut to Dec. 31, 1942, was 2,750,600 dry tons of ore, from which $25,179,160.43 were recovered.

(Min. Inf. Service, April 1, 1948, Calif. State Division of Mines.)

LOS ANGELES MINERALOGICAL SOCIETY FIELD TRIP TO THE DARWIN MINES

By JOHN A. QUINN
Publicity Chairman, L.A.M.S.

The L.A.M.S. were guests of Mr. Dudley L. Davis, Chief Engineer-Geologist of the Anaconda Copper Mining Company at its property, the Darwin Mines, Inc., Thompson Mine, at Darwin, California, on Washington's Anniversary, Feb. 22, 1948.

The writer joined Dr. P. A. Foster and Harold Eales at the corner of Glendale Blvd. and Colorado Ave., in the City of Glendale, at 7 A.M. Saturday morning Feb. 21st and we took the route over the Angeles Crest Highway to Vincent on U. S. Highway No. 6, turned right and proceeded through Mojave and Little Lake to Olancha where our speedometer showed 173 miles. Then we turned right over the lower end of the dry bed of Owens' Lake, then right again, and shortly arrived at Death Valley Junction—mileage 201. At this point we kept to the right (SE) for 3 more miles and turned left at a little Calcite mine where we gathered dog-tooth spar, and camped out-doors for the night. Next morning we resumed the journey for another few miles and arrived at the Thompson Mine, Darwin, where we were met by Mr. Davis and his assistant, Robert L. Wells. Some members who left Los Angeles late, arrived just in time for our tour of the mine.

The party split up into two groups, the 1st under the leadership of Mr. Davis being taken around the mountain and up a steep slope to the intermediate level of the Thompson Mine, and 2nd group under the leadership of Mr. Wells entering the mine at the Radiore level in mine cars, traveling a distance of some five to six thousand feet into the mine.

The 1st group were taken down several hundred feet of ladders to the Tungsten deposit where we gathered scheelite crystals for a few hours. Meanwhile, the second group were gathering galena (silver bearing), pyrites, pseudomorphs of limonite after pyrite, malachite, azurite, calcite, limonite, bornite, sphalerite, chrysocolla, cerussite, anglesite, native sulphur, plumbojarosite and clays.

After several hours of collecting, the first group were taken down several hundred more feet of ladders to the Radiore Level, including a mine-skip trip for several hundred feet, and finally after all were completely satisfied the party was taken out of the mine, a group over-all of about 40. There were a lucky Baker's dozen in the upper level party. After coming into the sunlight once more and drooling over our specimens, we were shown a nice collection by Messrs. Davis and Wells in the mine office, where we drooled some more. At about 4 p.m. we again split up into two groups, the 1st going home and the 2nd on to Lone Pine where they camped Sunday night and went eastward into the hills Monday morning and gathered amazonstone, the beautifully crystallized type of microcline. Harry C. Hurlbut, our efficient Leader, displayed a beautiful specimen of this green, semi-gemmy amazonstone at our March meeting.

The writer, wishing to make a lasting record of this wonderful field trip to Darwin, sent his notes to Mr. Davis who kindly corrected and made additions thereto, and also sent me a wonderful paper which he and Mr. E. C. Peterson, as co-authors, delivered before the American Institute of Mining and Metallurgical Engineers, at the Los Angeles meeting, Mining & Milling Division, October 24, 1947. I have selected certain portions of that paper, which I have quoted verbatum for your pleasure and enjoyment and believe you will find them as instructive and interesting as I did. With the kind permission of Mr. Davis I am showing in quotes all that follows, excepting those remarks under the heading of "Acknowledgments:" which are my own, based upon data secured from the paper above mentioned:

"LOCATION: The Darwin District is located about 30 miles east of Olancha which is 220 miles from Los Angeles via U. S. Highway No. 6. It is six miles south of California Highway 190 which goes through Death Valley from Lone Pine, Inyo County, California.

The town of Darwin lies at an altitude of 4750 feet and is situated on the west side of the Darwin hills and east of the Coso mountains.

"HISTORY: Rich oxidized lead-silver deposits were discovered in the early seventies. By 1875, Darwin had a population of about 5,000, and by 1880 several small smelters and mills had been built.

Early exhaustion of surface ores, the isolated location of the district, and fluctuation of metal prices resulted in intermittent operations until World War I when consolidation of the ownership was begun. Since then, the property has been owned or leased by the Imperial Lead Company, the Darwin Lead-Silver Company, American Metals Company, the Radiore Company, Signal Oil Company, and during World War II by Arthur Theis who operated the property under a management arrangement with the Signal Oil Company.

The Anaconda Copper Mining Company bought the property from Signal Oil, Mr. Theis and his associates in 1945.

"PRODUCTION: The district is estimated to have produced about $3,000,000 in lead and silver prior to 1900 and perhaps $4,000,000 between 1900 and its acquisition by Anaconda.

Under the present management, it has produced on the average of 75 tons of shipping grade and 140 tons of milling grade ore daily. A present mill expansion program will increase the capacity of the mill to 250 tons daily.

"GEOLOGY AND MINERALIZATION: *The* oldest rocks in the Darwin hills are a series of Paleozoic limestones, dolomites, shales and quartzites probably Pennsylvanian in age. These rocks have been intruded on the west by the Coso granite batholith and on the east by a granodiorite stock. Numerous sills and dikes grading from orthoclase granite to gabbro are exposed in the underground workings.

The sedimentary rocks have been considerably folded and faulted, the most prominent structure being a northwest pitching anticlinal fold, the crest of which lies just west of the ridge line of the Darwin hills. The east limb of this fold has been intruded by the granodiorite stock and east of the stock the sediments show several closely spaced anticlines and synclines. Two minor flectures on the west flank of the major fold are structurally important in localizing the ore in the Defiance and Essex Mines of the Darwin group.

There are three principal systems of faulting and fissuring, most of which are post-intrusive and pre-mineral in age, with minor amounts of post-mineral movement. The Darwin tear fault is the largest, most persistent fault in the district. It strikes N. 60 to 75° W, dips steeply south and is traceable for about 10 miles. It is a normal fault with a horizontal shift such that the north side of the fault moved west as well as upwards relative to the south side. Its relationship to the intrusive rocks is not clear but smaller parallel faults of similar nature cut the intrusive and so it is assumed that the fault is also post-intrusive.

A second system of fissures strike N 50-75° E, and show very little displacement and are commonly mineralized. A third set strikes N 10-40° E and are both pre-and post-mineral in age.

The mineralogy of the deposits is most interesting from a collector's standpoint, there being many rare minerals and mineral associations present. Genetically, there are three general classes of ore: replacement of silicated limestone (tactite) rocks, bedded replacements, and fissure fillings.

There are four types of ore to be mined, high grade oxidized silver-lead ores, milling grade oxidized lead-silver ore, sulphide lead-zinc milling ore, and

high grade tungsten ore.

"MINING: Mining methods are not standardized but are adapted to suit conditions existing in each ore zone.

Square set stoping is employed in the loose, heavy, high grade areas where only a small amount of ground can be opened up without timber and selective mining is necessary. In large replacement, orebodies, pillars are left between the square set stopes and the pillars later recovered by a modified Mitchell top slice. A modification of the slot method of stoping, as developed by the Anaconda Copper Mining Company in Butte, Montana, is used in the squares set stopes, with the main difference being that waste fill is seldom used.

Where the walls are hard or the vein quite narrow, open or rill type stopes are common and large areas of sulphide mineralization having strong walls are mined by shrinkage methods.

The orebodies occur in very hard tactite areas so that waste development work is done in the hardest of rocks. Practically all development and mining are done on a contract basis. Drilling in drifts and crosscuts on the main haulage level is being done with Sullivan hydrodrill jib with automatic DA-35 drifters. Electric haulage, and modern mechanical equipment are used through-out the mine.

For a 230-foot vertical development raise, a diamond drill hole was drilled to serve as a pilot for the raise and to furnish ventilation. The time saved in supervision and the speed with which the raise was run more than paid for the cost of the drill hole.

The ground is so hard that shaft sinking, both vertical and inclined, must be done with automatic drifters on a crossbar.

"MILLING: At present, 150 tons of mixed oxide, sulphide and dump material are milled daily. A bulk oxide float method is used, the oxidized lead minerals being sulphidized by sodium sulphide. In this matter, cerussite, jarosite, plumbojarosite and anglesite are all treated in the same flotation cells to effect about 85 percent recovery of the lead and 80 percent recovery of the silver in the ore. Any sulphide lead and zinc present are recovered in a preliminary step before sulphidization. Only about 35 percent of the zinc is saved under bulk oxide milling as most of the zinc is in the form of oxides. The mill is arranged so that future ore, which contains percentages up to 15 percent of sulphide zinc, will be processed into a lead-zinc sulphide circuit, with resulting products of both lead and zinc concentrates.

"MINERALOGY: A partial list of minerals found at Darwin is included in this paper. Because the Chief Engineer-Geologist at Anaconda properties is responsible for the mining engineering, contract measurements, sampling, and other technical work relative to construction, road building, etc., in addition to the examination of other properties in the surrounding area, little time remains for the determination of obscure minerals. A central research department is maintained at Butte for such purposes.

With a few exceptions of massive veins and bunches of galena, the high grade ores are strongly oxidized. Enrichment by subtraction of zinc, sulphur, and some iron during exidation is most important. Sometimes silver has been transported to be reprecipitated as sooty argentite and cerargyrite. Cerussite, anglesite, plumbojarosite and galena are the principal lead minerals found in the oxidized ores; accessory minerals are iron oxides, jasper, clays, sulphur gypsum, jarosite, calcite, hydromica, quartz, and fluorite.

Some of the rarer minerals found in the zone of oxidation are wulfenite, vanadinite, linarite, caledonite, hydrozincite, pyromorphite, and brochantite, together with azurite and malachite.

One end of a high grade oxidized lead-silver stope was found to assay 10 to 15 percent WO_3. Several hundred tons of this type ore have been mined and many well formed crystals of scheelite have been taken by collectors. These crystals are found lying loosely embedded

in a matrix of iron oxide, jarosite and clay. There has been considerable discussion regarding the origin of these crystals but the author is of the opinion that they were deposited at an early stage of mineralization related to the intrusive granodiorite and that later lead-silver mineralization took place along the same zone of weakness and engulfed the scheelite crystals.

In the ore zones where oxidation has not taken place, ore minerals are sphalerite and galena with minor amounts of chalcopyrite and tetrahedrite in a pyrite, fluorite and calcite gangue. The limestone is usually completely silicated to a mass of garnet, wollastonite, diopside, epidote, and quartz."

ACKNOWLEDGMENTS: The writer wishes to express appreciation of the members of our Society, as well as himself, to our genial host, Mr. Dudley L. Davis, Chief Engineer-Geologist of the Anaconda Copper Mining Company, and Mr. E. C. Peterson, Mill Superintendent, Co-Authors of the paper presented at Los Angeles, Oct. 24, 1947, to Mr. V. C. Kelly, whose paper on the Darwin District was used in the preparation of their report; also to Prof. Paul F. Kerr, for his work on Tungsten Mineralization and Determination of the Clay Minerals, as well as to the Anaconda Copper Mining Company for permission to reprint portions of this report, verbatum, as shown in quotes above.

In the name of the L.A.M.S., and for myself, I also desire to acknowledge and thank our genial hosts, Davis and Wells, for a most enjoyable field trip, also our efficient Leader, Harry C. Hurlbut, and Gordon B. Funk, who did so much to make this trip a success. I also wish to thank our President, Frank F. Larkin, Past President Wm. R. Harriman, their good wives, our hard working Secretary, Maude E. Wheeler, and last but not least the bulk of our members who contributed their support and presence to further the ends of our worthy avocation.

Molybdenite Occurrence at New York Tunnel

By T. Orchard Lisle

Recently the writer dropped in to see if any new rocks had been added to the pile at the Battery, New York City, from the Manhattan-Brooklyn tunnel, as considerable blasting excavation at the tunnel approach has been going on lately. He found that all rock is being trucked away as fast as blasted. However, taking a "look-see" over the old pile he found some molybdenite in smoky quartz, the first he has seen there; about 1,000 light-red "seed" garnets in one piece of rock the size of one's fist, and some kyanite crystals, pyrite and garnets in another piece of rock—all in about half an hour.

No other traces of molybdenite could be found, and one wonders by what freak of nature such a small deposit of molybdenite was formed. It was about ½" by ¼" by ⅛". At first the writer thought it was brilliant mica; but it marks paper, and a geologist to whom it was shown pronounced it to be molybdenite. In the same piece of quartz there are two green crystals, which possibly are apatite, and a few small poor quality garnets.

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Collecting under armed guard. By Dr. A. C. Hawkins, *Rocks and Minerals*, Feb. 1945, p. 64.

Garnets from New York Tunnel. *Rocks and Minerals*, May 1947, p. 417.

Tourmaline from New York Tunnel. By T. Orchard Lisle, *Rocks and Minerals*, Sept. 1947, p. 839.

The Oil Forum

The first of a series of four issues during 1948 to be devoted mainly to Middle East oil made its appearance during February. One article in this issue that is of intense interest is "Oil Men—Apostles of American Democracy", by Max Weston Thornburg. Another interesting article is "Door open to private exploitation of Turkish oil", by Ibsan Ruhi Berent.

The Oil Forum is a monthly magazine devoted to the petroleum industry. Its editor is T. Orchard Lisle who is well known in mineralogical circles as he is a member of many mineralogical clubs (including R. & M. A.). Some very fine articles from the pen of Mr. Lisle have appeared in *Rocks and Minerals*.

The offices of *The Oil Forum* are at 80 Warren Street, New York 7, N. Y.

GOETHITE IN A "KEOKUK" GEODE

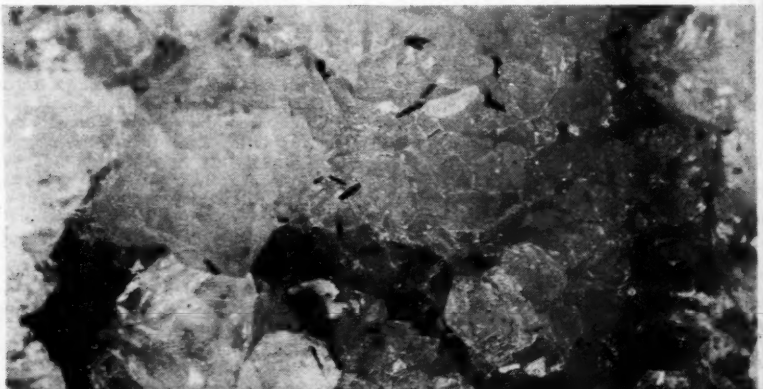
Crystals of goethite do not commonly occur in geodes, and none has heretofore been reported, to the writers' knowledge, from the geodes of the well-known Keokuk, Iowa locality. Therefore, the present occurrence may well be put on record.

A geode was collected from near St. Francisville, Clark County, Missouri, (this is part of the "Keokuk" area) by Mr. Otho Hagerman of Kahoka, Missouri, who recognized that the specimen contained an uncommon mineral, or at least one developed in a form unfamiliar to him, and sent it to the University of Missouri for determination. It has been determined by morphological and x-ray measurements to be goethite.

Only a small part, a piece about 3.5 cm. in diameter, of the entire geode shell was retained by Mr. Hagerman who exchanged the remainder with other collectors. The subject specimen has the usual rough, sugary-grained quartz and dense chert exterior, brownish gray coated, that is typical of the "Keokuk" geodes. The shell is about 1 cm. thick, grading inwardly into well-terminated quartz crystals about 2 to 3 mm. in diameter. The goethite crystals are slender prisms about 1 mm. long and 0.2 mm. in transverse section. Many of them lie full length on rhombohedral faces of the quartz crystals but others have grown inward toward the geode center from bases on the quartz crystal faces.

The goethite is dark brown, almost black in reflected light, and dark reddish brown in transmitted light. It is birefringent, and indices are very high. A poor biaxial interferece figure with 2V about 50° can be obtained but the dispersion, r greater than v, is so strong and inherent color so dark that optical character can not be determined for certain by use of the ordinary accessory test plate.

Two-circle goniometric measurements showed the forms [010], [210] and [311] to be present. Insufficient material was available for an x-ray powder photograph for identification purposes. Consequently a rotation and Weissenberg photograph were taken with c the axis of rotation. These gave the following values which are in excellent agreement with



Goethite (black crystals) in a Keokuk geode.

the published data on goethite:

$a_0 = 4.60$, $b_0 = 9.94$, $c_0 = 3.00$

giving the ratios:

$a_0 : b_0 : c_0 = 0.464 : 1 : 0.302$

In 1916, Van Tuyl[1], described the "Keokuk" geodes and reported the following minerals present: quartz, chalcedony, calcite, aragonite, dolomite, ankerite, magnetite, hematite, pyrite, millerite, chalcopyrite, sphalerite, kaolin, limonite, smithsonite, malachite, gypsum, and black viscous bitumen. Later writers on the geodes include Haskins[2], Wherry[3], Robertson and Brooks[4], O'Bleness[5], Grinstead[6], and Tarr and Keller[7]. The latter found tiny crystals of kaolinite deposited from solution inside many geodes. The occurrence in crystals of relatively insoluble minerals like quartz, kaolinite, magnetite, and goethite, and their association with sulfides like millerite, chalcopyrite, and sphalerite, and with tarry bitumen, all within quartz and chalcedony enclosed cavities surrounded by a relatively impervious shaly rock, indicates an environment or changes in environment of deposition that, quoting Van Tuyl, are "difficult to account for".

A clear understanding of the origin of these geodes will probably parallel a similar understanding of the origin of the lead-zinc deposits of the Mississippi Valley region, and of the ores in the filled sinks of Missouri.

After this manuscript was prepared it was learned that Mr. Eldon Moore of South English, Iowa, had previously found geodes containing goethite on the Illinois side of the Mississippi River near Keokuk. He wrote (March 7, 1948), "A volume could be written on this locality by one who could spare the time for a whole season's research and field work. The locality has never been adequately covered." It looks like a Master's thesis problem is wide open here for a gemologist interested in mineralogy.

Cornelius S. Hurlbut, Jr.
Harvard University.

W. D. Keller
University of Missouri.

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A UNIQUE AMETHYST GEM

By PETER ZODAC, Editor
Rocks and Minerals

On a recent trip to Mexico with Don Gabriel, of Detroit, Mich., we spent a day at Queretaro, Mexico. Here we contacted Eduardo Hernandez, a noted gem cutter of the city, who not only spoke excellent English but was our guide. Of course the cutting establishment of Mr. Hernandez (Eddie to his friends) was visited (Fri. April 23, 1948) where we inspected his lapidary shop and purchased some minerals from his large stock.

A unique gem was acquired by the writer. It was a nice facetted amethyst of 14.85 carats (5/8" diam.) and of a fairly deep color. The unique part of the specimen is that it has a large movable bubble in about the center of the table; the bubble moves almost 1/4 of an inch.

The gem had been cut by Eddie. He had seen the bubble and tried to preserve it and yet have it well centered. It is an excellent piece of work and furthermore it is the first gem stone seen by the writer to feature a movable bubble. The amethyst, cut from a large crystal, comes from a new locality near Taxco, Mexico.

Incidently Mr. Hernandez' shop is located at Altamirano 2 Sur, Queretaro, Qto., Mexico.

BIRTH OF A NOTION

After a casual glance at their awesome titles, offhand opinion concludes that geological and mineralogical societies must be dull affairs. If John Doe only knew, each organization has an intriguing story right from birth. The Illowa Rockhound Club is no exception, for it was born in a show window. This wan't a publicity stunt, such as might be devised in this Age of Ballyhoo. As the saying goes. "It just happened."

The story begins, "Once upon a time" when a lone rockhound wandered lonely as a waif in a metropolitan area of a quarter million people. Amidst a multitude of men, he had no rockhound acquaintances; he knew of no lapidary shops; and no hospitable mineralogical society existed to welcome him. The more alone he felt, the more he yearned for what ought to be.

So the solitary rockhound sniffed and prowled over that cluster of Illinois-Iowa Mississippi River towns which in their development have been titled successively with the inclusive prefixes: Twin-, Tri-, Quad-, and Quint-, of which group Davenport, Iowa, is the largest city. After much dogged roaming, he finally discovered several hermit-like, cellar shops for stone polishing. Also he learned of various mineral collections, part of which were like miser hoards. If gems and rock specimens from some of these isolated sources were pooled, a good exhibit might result. Perhaps a number of people were "rock hungry" and would be happy to know that the community as a whole wasn't destitute of mineralogical interest. So the idea of a unified display grew definite.

The question arose, "To which place would the most people be attracted in the most convenient way? The answer was, of course, "A handy show window on a busy street." This method of display was then put into effect.

The exhibit proved a great success. A parade of people stopped, looked, and pondered, both day and night. Under an ample battery of fluorescent lights, colored gems of red, yellow, green, purple, rose, black, orange, gleamed their hues to best advantage. Fascinated spectators expressed surprise and delight in viewing a scintillating group of crystals. Some people made special study of representative Bible gemstones which had been the object of research by George F. Kunz and many previous investigators for hundreds of years. Women and high-school girls were thrilled by the assembly of necklaces, some of which were ancient Egyptian and as attractive today as when first assembled 3,500 years ago. "City-fied" men and boys were astonished that a collection of fine agates had come right out of the neighboring Mississippi River which was just a few blocks from the show window. Many people couldn't believe that the display of jade was American and hadn't come from China. Other confusions were clarified: that opaque green stones such as chrysocolla weren't necessarily turquoise; that yellow tiger-eye wasn't amber; that red garnet wasn't ruby. A labelled collection of fifty selected minerals was the reason for note-taking by some studious-looking individuals. An assortment of unlabelled gems was the feature of an identification contest, which caused an epidemic of delving into public-library references on gemstones. The purpose of the lay-out scheme in the show window was to have various centers of interest, with something of special appeal to every person who looked. The method worked.

This window display gave rise to an oft-repeated question, "Why can't we have an organization for people who are specially interested in gems and minerals?" Thus it happened. Inevitably, the Illowa Rockhound Club was born.

To the lone rockhound, for whom the Quint-Cities of Rock Island, Moline, East Moline, Bettendorf, and Davenport had been so desolate, the club members proved to be gems of humanity, just as the show window had revealed jewels of the mineral kingdom. The membership, representing a dozen towns, was composed of men and women of all ages, plus boys and girls.

No. 1 member turned out to be an outstanding minister of the region who had collected excellent mineral specimens in his travels, but had failed to "follow through" by making gems. All his life, he had wanted lapidary connections and this was his first opportunity. As a token of his joy, he insisted on writing a check for the club, even before it was organized. A married couple, who were real buddies, explained, "This is the hobby we've been wanting. It's ideal for us." Two boys, from distant Coal Valley in Illinois, couldn't get a ride to a club session; so they jumped onto bikes, rain or no rain, and pedalled their way through miles of darkness. Other spark plugs for the meetings were delegates from farther-away Morrison, Illinois. Even before the Illowa Rockhound Club was officially organized, talk began about having it serve as parent for an offspring society "up the river." A cart before the horse doesn't compare with such a baby-before-the-parent-for-it situation. A girl collector from Muscatine, Iowa, confessed, "My teachers haven't understood what I'm trying to do, but they're getting educated fast." Two elderly gentlemen were Pleistocene fans as ardent about ice-age geology as movie fans about Hollywood stars. They could read Illinois-Iowa glacial landscapes like a book, and wanted more company for their hobby of enjoying the marvels of what ice had wrought. A retired civil-service employee owned scores of beautiful gems and minerals, but their technical names would always slip his mind; as a division of labor, he centered attention on lapidary cutting while his wife specialized as word-memorizer and curator. A young lady and her husband were of troubled mind. She was so enthusiastic about the club, and wanted to cut gems—but, her husband.... He wasn't interested. They regretted any cleavage, caused by rocks. When assured he would always be very welcome as her guest at the club and would be enjoyed as a kibitzer, both were made happy as singing larks. The policy of the club, they found, was to have it family-like, with genuine hospitality for guests. In addition, junior members were specially favored in the organization.

Mineralogical and geological societies, in spite of their sometimes imposing names and assumptions by uncomprehending John Doe, are anything but dull. Their origin isn't from cold-blooded, professional, commission-receiving organizers. They are community expressions of what ought to be. They are constructive, cultural organizations with activities suited to various talents and interests; the type of membership attracted is unusually wide-awake and friendly, with worthwhile associations for everybody. To uninformed John Doe a mineralogical society may be a dog house to him. But the lone wanderer over five cities found that such an organization proved to be a happy haven for an extensive rockhound clan, which gathered eagerly from miles around.

In case mineral hobbyists around the world or other "fans" would care to correspond with Illowa Rockhound Club members, we will be glad to hear from them. The officers are as follows:

President, Oscar A. Anderson; Vice-president, Edwin A. Ahler; Secretary and Treasurer, J. J. Parsons; Curator, John H. Bailey; Photographer, George E. Radeck; Lapidary Service, Elliot W. Peck. The club headquarters are at The Davenport Public Museum, 704 Brady Street, Davenport, Iowa.

J. J. Parsons, Secretary
Buffalo, Iowa

Old Lead and Zinc Mine to Reopen

Galena, Ill., May 2, 1948.—A switch was thrown today and huge pumps started draining the Blackjack mine, idle for more than 20 years. Now owned by Tri-State Zinc company, Inc., the Blackjack long held the title of "Galenta's richest mine."

After the shutdown in 1926, the shaft filled with water, and engineers estimate that about three months will be needed to drain the old workings.

In its 100 years of existence, the mine produced lead and zinc ore valued at about $25,000,000. Test drillings carried on in recent years indicated that the old mine, far from being worked out, contained additional ore which justified the expense of draining it.

(Item sent in by E. F. Ellmaker, of Sterling, Illinois)

CELESTITE IN CENTRAL TEXAS

By DR. T. R. HAVINS
Box 25, Brownwood, Texas

The Cretaceous rocks traverse the state of Texas in a general northeast-southwest direction. In the central section of the state where the rocks of this age abut the earlier Pennsylvanian rocks and where contact is visible, the basic Trinity Series of the Cretaceous are in evidence. Dr. Robert T. Hill, the eminent geologist, worked out the geology of the Cretaceous of this section more than sixty years ago. His work has become a classic. Strangely enough, however, in only one instance did he mention the occurrence of *celestite* in the Cretaceous and then only in connection with its presence in limited quantities near Austin, Texas. For some reason or other he overlooked the presence of this mineral in large quantities in two Central Texas counties.

Brown and Mills counties are located near the geographical center of Texas. In these two counties are to be found several million tons of *celestite* that could be mined with ease as well as several other million tons not so easily obtainable because of the presence of overlying shale burdens. The deposit lies near the top of the Trinity Series, some fifty feet below the Edwards Limestone. The mineral lies in beds from four inches to twenty-four inches in thickness. Typical outcrops can be seen on Highway 67, 7.3 miles east of Brownwood and in a cut along the Gulf, Colorado, and Santa Fe Railroad, four miles northwest of Mullin in Mills county. The mineral exists in practically pure state, only infiltrations of shale and a little calcite mar its purity.

The crystallography of the *celestite* is interesting. All the known forms of this mineral, including prismatic, pyramidal, bladed, acicular, and granular types are common. It is not unusual to find as many as three types in a small nodule. In a number of instances it has been observed with prismatic forms making up the bulk of a ledge only to be surmounted with a capstone of acicular crystals no more than a half-inch in length. In other cases acicular crystals are found with all other types wanting. In such instances the hair-like crystals exist in aggregates reaching many feet. Their usual length is a little over three inches. A small bundle an inch in diameter contains hundreds of the individual crystals each the length of its fellows. In a few places they are bent near the base. In other cases they appear as strata one upon the other. The writer has observed acicular crystals in one locality that were coarse, being the size of knitting-needles and six inches in length. The acicular crystals exhibit a blue color which changes to white on long exposure to sunlight.

Another unusual occurrence of crystal forms and of color is to be found in certain sections of the deposit where geodes abound. In these instances the geodes will have an outer layer of pink tabular crystals. The cavity will be lined with prisms and pyramids reaching a maximum of one and a half inches in height. Side by side with the geodes will be found detached nodules up to a foot in length and weighing thirty pounds made up entirely of salmon-pink crystals, both bladed and prismatic, and measuring an inch in length.

Much of the material is coarse granular and as such presents a dirty appearance. Where ledges have not been eroded the material is a delicate blue or a fine white in color.

Unrestricted collection is not possible since all tracts of land are privately owned.

R. & M. A. Member on Air Trip to Japan

Greeting Mr. Editor:

This is from C. W. Van Campen, of Dayton, Ohio. Am now approaching Kwajalein about 1 hr. or 200 miles out. Spent yesterday on a tiny U. S. outpost. Nothing much but coral sand and a few shells plus some wonderful fishing. Just passed over the former Jap atoll of Wotje. The reefs were beautiful in pastel blues and greens.

Aboard Airliner
(Enroute to Japan)

April 5, 1948

LARGE PARK LEVELED AND GRADED IN TWO DAYS BY VOLUNTARY EFFORT

A million dollars worth of giant, rugged, earthmoving machinery numbering 140 pieces of equipment, leveled and graded 160 acres of land near Peoria, Ill., April 24 and 25, 1948, for site of a park and recreation area for the city.

In the most spectacular achievement of its kind ever attempted, the "Off-the-Roadeo," staged at Exhibition Gardens, six miles from downtown Peoria, moved more than a quarter million cubic yards of dirt in less than 48 hours.

The entire operation was performed by voluntary effort—work that would have cost more than $90,000. Every item used in the job was contributed free of charge—the operation of the machines, the machines, the gas and oil they used, food the workers ate, and the lights that made night work possible.

Enough dirt to make a ditch one foot wide and one foot deep from Peoria to Denver, a distance of 1,000 miles, was moved during the operation.

Tires manufactured by the Goodyear Tire & Rubber Company played an important part in carrying graders and scrapers over the rough, uneven terrain. More than 70 percent of all machinery used on the project was equipped with Goodyears.

Army engineers were there to observe performance of the latest creations by manufacturers of heavy equipment. Thousands of visitors drove by the site for a glimpse of the demonstration.

Reporters and photographers from newspapers, wire services, and magazines were present for the demonstration. Also on hand to record and transmit the unprecedented event were television, radio, and newsreel men.

Hard-hitting earthmoving machines, on Goodyear tires, were half way through the job of leveling and grading 160 acres of land near Peoria, Ill., when this overall photo was taken. Photographers, reporters and newsreel men can be seen in the foreground. All labor, equipment, fuel, food, lighting and engineering services were donated.

SOMETHING NEW IN ROCK STORES

In San Diego a rock store has been opened which does not have the making of money as an essential part of its program. Having seen the beneficial effects in the life of a young alchoholic of trips to mines, climbing of mountains, and days spent in the search for gems and mineral specimens, the owner of this new enterprise determined to start a "rock museum" where young people could become enthused in rock collecting before harmful influences could enter into their lives.

Mr. J. L. Kraft of the Kraft Food Corporation, a devoted "Rock Hound, was consulted along with Solon Kipp and other well known enthusiasts. It was seen in the beginning that the enterprise would not be an immediate money maker, if ever. Therefore the establishing of high ideals and the finding of God in nature by our coming generation was placed first, and the making of money a secondary consideration.

Mr. Kraft wrote a wonderful letter to the owner, which reads in part,;

> "I congratulate you upon the opening of your Rock Museum. I predict for this enterprise of yours a success beyond your expectations. If it were possible to have a far greater percentage of our citizens interested in rocks, minerals, and the great outdoors, many of our controversial problems would be solved. The "rock-pile," using the term literally, is one place where clashing of ideologies and differences of opinion disappear, excepting the possible determination of what some of the rocks might be.
>
> The great outdoors is a place where people come nearer to their Creator than any other spot. Searching for the things of nature, out where nature dwells, will clean the mind and purge the soul and bring into unity the people of all kind who dwell together upon this earth."

When a youngster comes into "Scott's" with a nickel or dime or even with just a wistful look in his or her eyes, they do not go away without a specimen to bring a sparkle to the young eye and a feeling of happiness. If one of them asks that the place stay open until he can go home and get his nickle or dime, the store obediently stays open long past closing time, until a rapidly breathing youngster can return and claim the specimen that caught his fancy. If the price of the specimen was several times the nickel or dime it is still just that price to the eager boy or girl. That is the policy of this new "Rock Museum".

It may be the constructive work being done by our friend, Mr. Solon Kipp, that has played its part in encouraging the start of our new enterprise. Mr. Kipp holds classes in his new Super De Luxe Lapidary Shop (which with its material and equipment may have cost far in excess of $25,000.00) and even furnishes much of the material used by the classes. The classes are entirely free and of course a source of much expense to Mr. Kipp in the wear and tear and sometimes damage done innocently by inexperienced students.

A part of the program of "Scott's" is the accumulation of unusual specimens that will attract the attention and arouse the enthusiasm of young people whom we wish to encourage in the "Rock Hound" hobby. Therefore we welcome the cooperation of collectors throughout the country who may wish to either loan or donate or sell us (as far as we can afford to buy them) unusual specimens that will play their part in interesting youngsters in our fascinating and constructive pursuit.

A second part of our work, which we hope to inaugurate in the not too distant future, will be the creating of a work shop where the boys and girls can come and grind and polish their rocks without expense to themselves. We know that boys and girls sometimes have slender allowances and we do not wish to let a small amount of money prevent their

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continuing enthusiasm. We may not be able to build a wonderful shop such as our friend Mr. Kipp has, but we can furnish a shop that will be a stepping stone which will possibly lead to a "post graduate" course in one of Mr. Kipp's classes. It may be appropriate to congratulate the Leaders in our Hobby here in San Diego who have been the means of arousing the interest of many constructive rock enthusiasts. I know of no other city where a beginner may start in free classes and work on all types of material such as in Mr. Kipp's classes, first making cabochons and ending up (as it is planned) faceting precious and semi-precious stones.

We also plan silver-smithing instruction, so that our young friends can make silver ornaments and set their stones in them, usually a brooch or pin for Mother or a ring for Father, to show "how smart they are getting". This not only keeps them out of mischief, but cements family ties in showing their devotion to their parents and appreciation for the care in their more tender years. Of course parents quite often buy them small and inexpensive all purpose machines, in which the parents themselves quickly become interested; they may also purchase the equipment needed for working in silver.

Scott's hope that our idea may be used by many others throughout the country to the eternal benefit to our civilization as far as we are able to influence it. We ask your blessing and good thoughts on our enterprise and we will be glad to communicate with anyone wishing to profit by our experiences. At the present time we are selling books, Mexican Silver Work, cut stones and jewelry in an attempt to "carry" or support our Rock Museum and future free work shop. We also have a mail order business in minerals and stones which has this same purpose in view. There is no telling at present just what we may have to sell to support our "rocks" but rest assured we will be happy to do whatever is necessary to carry on the constructive work that we know our rocks can do. Again we ask the kind thoughts, blessings and cooperation in the way of loans, gifts, or sales at prices we can afford on mineral specimens that will attract young people, and even specimens we can give them to start their youthful collections. We will be glad to cooperate with others doing a similar work by shipping them specimens free that abound in this section of the country and which would be strange and interesting elsewhere. (For example Abalone shells with their beautiful coloring and iridescence are quite easily obtained here and would be a rarity and a means of arousing enthusiasm in other states.) We hope twelve months from now to write another article giving *Rocks and Minerals* the results of our endeavors along these lines. Our store is located at 5029 Newport Ave., San Diego 7, Calif.

Will Friedensville be the Franklin Furnace of Pennsylvania?

New zinc ore developments are being carried out actively at Friedensville, Pa., by the New Jersey Zinc Co. of Pa., subsidary of the company which operates the famous mines at Franklin and Ogdensburg, N. J. Friedensville is not far from Bethlehem, Pa. Perhaps the workings will produce fine mineral collector's specimens? If any reader visits this locality it is to be hoped that he will courteously and promptly send an account of his experiences to *Rocks and Minerals*.

T. O. L.

Congratulations from an Old Subscriber and Advertiser!

Editor R. & M.:

I want to congratulate you as being the first man to start a mineral magazine in the United States (20th Century—Ed.)

As you may remember I was one of your first subscribers and have been taking your magazine for over 20 years. I have also advertised with you all these years and consider your magazine very valuable to many people as it has been to us. *Rocks and Minerals* has advertised our Rose Quartz all over the United States and in some foreign countries, too.

I am now 81 years old and the business will go on with my son. I wish for you many more years of success with the magazine.

Edna M. Scott,
Custer, S. Dak.

April 24, 1948

THE AMATEUR LAPIDARY

SOME TIPS ON THE USE AND CARE OF DIAMOND GRINDING WHEELS FOR LAPIDARY WORK

By A. H. MILNER
3954 N. Capitol Ave., Indianapolis 8, Ind.

Let's understand at the outset that this is not the advice of an expert, but only the meat of what I have learned from the use of various kinds of diamond wheels in the past two years. Since I have seen no published articles in any of the Mineral Magazines on this subject, I believe what I have learned may be of interest to other amateur cutters.

I first bought two five inch wheels with a 1-1/16" face in 1945. One was a 100 grit, one a 320 grit, both resinoid bonded. At that time, I had been using 8" laps for both cutting and polishing and 5" diameter seemed too small and I wasn't at all sure a 1-1/16" face would be enough, but since these wheels cost approximately $90.00 each, I was certain I didn't want to spend money for diamond that wouldn't be used, and that would have been the case had the diamond been across the flat face to the center. In the sake of those who have not yet had any experience with diamond wheels, the subject wheels are known as plain cup wheels with a diameter of 5". The rim of this cup wheel is about 1" thick at the periphery and runs back in a flat face on the top side for 1-1/16" then is machined down to 3/8", from there to the center to form a center web. The bottom of the wheel is perfectly flat all the way across.

These two wheels were war surplus and had 1-1/4" arbor holes so they had to be fitted with bushings for my arbors, which were 1/2". These bushings were made of bearing bronze, so as to be rustproof. (The bodies of practically all good diamond wheels are either aluminum or molded material, so are rustproof.)

Manufacture's recommended peripherical running speeds of from 2500 to 5500 surface feet per minute. Why the difference? I found by experimental runs that running speeds had very little direct effect on wheel life, but did make a difference in cutting speeds, wheel life being more or less proportional to cutting speed, i.e., if cutting was exceedingly fast, wear was somewhat faster directly proportional So after a bit of speed changing experimenting, I decided a spindle speed of about 1750 or 2000 was the best, this being the approximate speed of many standard 1/4 to 1/2 H.P. motors. Faster speeds posed a problem of balancing, wheels and spindles running at 3600 R.P.M. have to be balanced much better to be smooth and safe.

The next question was what to use for a coolant. I first tried a 1/16" stream of clean water running out of a one gallon can with a shut-off cock with an 8" length of 1/8" copper tubing, pinched off on one side at the end to make about the 1/16" stream, which should run without pressure against the face of the wheel, as close to the work point as possible. Kerosene may be used with the same kind of can arrangement, and it may be a little faster than water, but not enough to offset the cleanliness and convenience of water. I didn't have much luck with any of the water soluble compounds which I tried. They gum the wheel surfaces after a few minutes and do not offer any advantages over clear water. If your wheel is vitreous bonded, never use any coolant except water. Always spin wheels dry on spindle after use, or before removing and storing.

Although diamond wheels do not require much dressing if used properly on hard minerals, it is sometimes necessary to true the face of a wheel slightly, this can be done with the silicon carbide dressing sticks sold for the purpose by any of the diamond wheel manufacturers.

Start the wheel and turn on the coolant, lay the silicon carbide dressing stick on the wheel with long axis of the stick parallel to an imaginary line across the center of the wheel, moving it back and forth two or three times, so as to get the entire surface of the diamond. This is generally enough, more dressing is wasteful.

I find the most useful application of diamond wheels for cutting facets on crystal or synthetic mineral 7 Moh or harder. I cut more synthetic sapphire and spinel than anything else, but beryl, chrysoberyl, zircon, topaz, clear crystal, amethyst, and citrine have been cut with good success. Naturally, I thought grits should be about the same as silicon carbide wheels, but, a 100 grit diamond wheel is much to fast and rough for any but the largest sapphires and spinels, and these have to be cut with care, or the corners disappear right now. 220 grit is fairly good for rough cut on large stones, but 320 grit is plenty fast for any except the largest. 320 works nicely on any stone down to ⅓ carat without much corner breakage and these cuts can be polished directly without further cutting. Cup shaped wheels are not as good for cabachon cutting as wheels with diamond in the periphery. For cabachon work, it is not advisable to use a diamond wheel for any stone softer than 8 Moh., because a silicon carbide wheel will do just as good and almost as fast at much less cost.

If you are intending to try a diamond wheel and you only have funds to buy one, by all means get a 320 grit wheel. If you can afford two wheels, get 180 or 220 and 400 or 500 grits. The coarse wheel to make rough cut and fine for finish before polishing. Don't buy a wheel with less than ¾" face, unless you only cut very small stones. Five inch diameter is large enough, six may be a little better, but it's better to have a 5" diameter with 1-1/16 face than a 6" with ¾" face. Any of the bonds are alright, metal will last longer, but will not cut quite as fast a resinoid or vitreous bonds, for a given grit size.

In general, no hard and fast rules can be set for using these wheels, it takes some experience to know just how to use them properly, but very heavy positive pressure is never necessary. Stones should be applied to a wheel rather lightly and pressure increased till cutting is as fast as possible with minimum wheel wear, move the stone back and forth to cover all the face of the cutting surface. This will maintain a straight face and cut down dressings. Be careful to never let the end of the facet head spindle, either with or without a stone dopped in, drop and catch the face of the wheel, because this will sometimes cause it to dig into the face and will practically ruin an expensive wheel, especially a vitreous or resinoid bonding.

Have a place to keep a diamond wheel so it can't be injured by the fall of tools, other wheels, stones, etc. They cost a lot of money and must be handled as such. If handled with reasonable care, and used with caution, a wheel will last a very long time.

Famous Gem Mines Reopened

The gem mines of the Pala district in San Diego County, Calif., have been reopened. The Frederick M. Sickler holdings on Heriart Mountain have been sold to Mr. George Ashley, purchase taking place in mid-July, 1947. Ashley has since disposed of some of the claims to others, but the present owners have all been doing rehabilitation work at the mines. The Katerine claim, retained by Ashley, has been the center of greatest activity. Mine workings have been reopened, a water-pipe line has been laid, and new compressed air equipment installed. A new adit is being driven on the Katerine pegmatite. During rehabilitation work some gem spodumene or kunzite was recovered. Plans are being made to reopen the Vanderburg claim, another old time producer. (Min. Inf. Service, April 1, 1948, Calif. State Division of Mines)

(Mr. Ashley is a member of the R.&M.A. —*Editor*)

THE MICRO MOUNTER

Conducted by Leo N. Yedlin, 557 W. Penn St., Long Beach, N. Y.

This page will be conducted for the collector interested in micro-mount mineralogy. We'll try to publish it monthly, and we'll try, too, to include news, information, ideas, shortcuts, supplies, etc., so that readers interested in this phase of mineral collecting will benefit from the experiences of others. In other words, this page will be yours, for swapping ideas, (and specimens, perhaps) and for informing the collecting world of the superiority of this type of mineralogy.

There will be some smirking, no doubt, but we do recall last summer in Maine, when we, accompanied by Lou Perloff of Brooklyn, N. Y., and Andy Snyder of Randolph, Maine, trudged down Plumbago Mountain, Newry, (temperature 98 degrees) each of us with about 2 pounds of fine material, and speedily overtook and passed several people loaded down with tons (it seemed) of rock. We knew we were approaching them by the discards they left along the trail. When they reached bottom they had about as much material as we did. And what did we have, after collecting in an abandoned quarry? Well, after mounting the best in standard 1 inch square boxes, the results were as follows:—Eosphorite, herderite, vivianite, hair tourmaline, microlite, cassiterite, columbite, apatite, childrenite, sceptre quartz crystals, and a purple pseudo-octahedral group as yet unidentified. All superb crystals, too.

Seriously, however, the advantages are obvious. So many collectors cannot afford the space that hand specimens require. The matter of expense is no little item, for splendid crystals of most anything in micro-mount size cost practically nothing. And so many minerals crystallize poorly in large sizes, even tho the massive material is easily available. We recall a mass of hancockite obtained from the late Billy Ball of Franklin, N. J. Brick red, uninteresting, it was kept because it filled a gap in the Franklin cabinet. After working with the microscope, tiny vugs were explored, and found to be filled with blood-red needles of the mineral, associated with golden axinite crystals, and several clear clinohedrites! This always happens. No matter how good a hand specimen is, its microscopic counterpart is superior. By all means collect good hand material. But if you really want to study mineralogy, if you truly love beauty and perfection, then become a convert to this ever growing popular field.

It is not too necessary at this time to go into equipment and techniques. A stereo binocular microscope, of the Greenough type, with very low power objectives, and 10 power oculars, producing from 24 to 36 magnifications is best, providing greatest depth of focus and true appearance. This is an expensive item, but in this case the initial cost is the great one. The upkeep is negligible. However, any good scope will do. Just keep the magnification low. For further details as to proccedure you are referred to two fine articles previously published in *Rocks and Minerals*, and still available. Preparation of Micro-Mounts" by L. C. Wills M. D., (December, 1931), and Micro Mineral Mounts, by Jay T. Fox (December, 1940) give the historic and technical data necessary to the beginner and advanced collector. These are comprehensive articles. This column welcomes additional information from any of its readers. We reserve, however, the right of including, editing or omitting anything submitted.

We have recently received, thru the medium of exchange, fine specimens from John Parnau of Stockton, Calif., Gunnar Bjareby of Boston, Mass., Dr. L. C. Wyman of Jamaica Plains, Mass., as well as some mounted oldtimers from E. Mitchell Gunnell, of Denver, Colo. Parnau sent clinoclasite, olivenite, zeunerite, uvarovite and many others. Bjareby and Wyman furnished good New England material, as

well as some foreign minerals. Gunnell's material was general, and showed care and good judgment. Parnau collects small and hand specimens of crystallized minerals. Wyman and Bjareby both the micro material and hand specimens. Gunnell adds only superb unusual minerals to his large cabinet. They have loads of stuff, and welcome communications.

While we're on the subject of exchanges, may we voice a long needed bit of advice. Please don't send junk around. Bear in mind that a duplicate is not a discard—something not good enough. It should be what its name implies, a duplicate, a good specimen, one too many for your own collection. Too often a battered and bruised piece of nothing is shipped, postage is paid, and a bitter taste is left all around. The recipient resents the junk and the sender gripes because he isn't appreciated. Let's guide ourselves accordingly.

Larry Sampter of New York uncovered a new deal on boxes. Remember how tough it was (and still is) getting micromount stuff? Well, the jewelry supply houses have clear plastic boxes, snug covers, 1" x 1" for less than a dollar per dozen. Similar boxes for odd sizes, 1" x 2" and 2" x 2" also can be obtained for under a buck. Clear lacquer or household cement holds labels permanently, and the plastic won't disintegrate in time. If only they were in black, they'd be perfect.

This column is interested in lighting problems and their solution. A brilliant concentrated white light is needed, and various methods have been tried. Wills and Fox in their articles describe several methods. The optical people put out rigs ranging in price from a few dollars to about $50. We use a two bulb fluorescent desk lamp, good, but far from perfect. Bjareby has contrived one of his own, with sliding tubes for focusing. An ordinary desk lamp, with a double convex magnifying lens on a stand provides an excellent point of light. Maybe you have something better. Let's hear from you.

POST OFFICE BOX NUMBER DEALERS

By MaryAnn Kasey, P. O. Box 230, Prescott, Arizona

As a strictly mail order dealer having done business for the last three years, I felt Mr. J. J. Brown of Austin, Texas (see his article on page 300 of *Rocks and Minerals,* April issue) is evidently not very familiar with our western states even though he resides in one of our largest states in the Union. His several caustic remarks about Box Number dealers clearly brings this out.

The reason we box number dealers do not show directions to our homes is because we sell strictly thru mail and live in more or less outlying districts and to have directions appear monthly in display ads would be rather a costly procedure.

The writer personally has had a great many wonderful rock collecting friends call on her, but found that all would first write for directions when they were contemplating trips to Arizona. I have made hotel reservations for dozens of my rock friends in the past few years and, in that way, there just isn't any confusion or aggravation as Mr. Brown points out.

As an instance, the writer has recently sold her home near Prescott and now lives in a mining camp, and even if the name of the mine were to be shown in the ads, directions still would have to first be obtained before being able to find this camp.

I trust this short article will help others to enjoy more pleasant trips to our western states by first contacting us box number dealers. After all, we still do have great wide-open spaces and towns and cities are far and few in between. So, rock friends, do write us first and I assure you we outlying box number dealers are just as pleasant, even more generous and hospitable than the more fortunate ones, who have their nice agate and mineral shops with city street numbers. Here's to making your acquaintance without aggravations.

HERBERT PERCY WHITLOCK 1868—1948

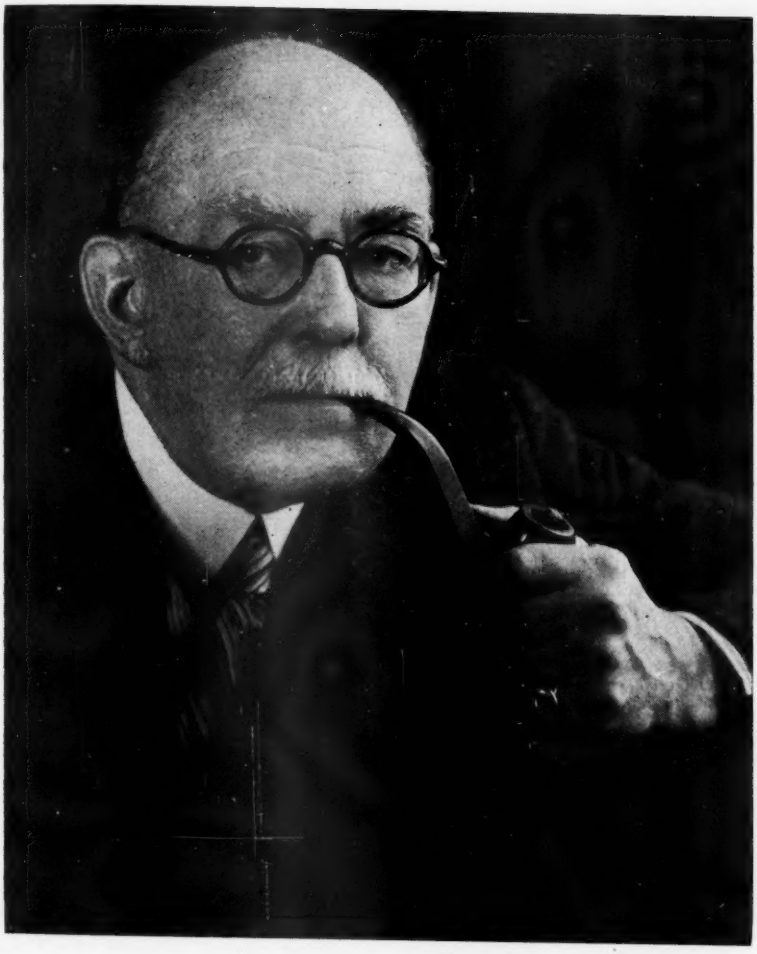
The death of Herbert Whitlock, who served for twenty-three years as Curator of Minerals at The American Museum of Natural History, has taken another of the world renowned scientists of the old school from mineralogy. Mr. Whitlock was a native born New Yorker and lived most of his life in that city. After graduating from Columbia in 1889 he took a position as assistant to Prof. Alfred E. Moses in the mineralogical laboratory; leaving it in 1901 to become Assistant Mineralogist at the State Museum in Albany. In 1904 he became Mineralogist and in 1916 he was appointed State Mineralogist.

This position was not held for long, however, because he accepted an appointment as Curator of Mineralogy at The American Museum of Natural History in New York City, to fill the vacancy left by the death of Louis P. Gratacap. This was a great opportunity upon which Mr. Whitlock seized, for he enlarged the collection by literally thousands of specimens. It was during Mr. Whitlock's tenure that the Museum received the I. Wyman Drummond bequest of jade and oriental carvings, and the William Boyce Thompson collection of minerals and jade. These gifts put the Museum to the forefront of Chinese jade collections and the myths and legends associated with jade became one of Mr. Whitlock's hobbies. The development of his interest in jade may be noted in his bibliography, and will culminate too late for him to know it in the publication of his book, "The Story of Jade", promised for this year. It is unfortunate that he could not have lived to see the publication of the book, so long delayed by world conditions. His personal collection of small jade carvings was destined for the Wadsworth Athaneum at Hartford, at which institution he was Honorary Curator of Jade from 1929 till his death.

The promise of scientific research that may be noted in the list of early publications while Mr. Whitlock was in Albany was directed into other channels when he came to New York. Here he found that the demands of the public were such that he was no longer able to devote many hours of the day to research work, and he also felt that he was not justified in selfishly continuing to devote himself to pure science in this new position. Consequently, we note that he became a master at interpreting scientific writing for the layman, and most of his papers after his return to New York are of this type. His "Story of the Minerals" and "Story of the Gems" together with the expected "Story of Jade" are all good examples of the writing at which he became so proficient. On the other hand, his monograph on calcite, published during the days in Albany, set a high mark among mineralogical papers of that time.

No appreciation of Herbert P. Whitlock would be complete without recalling some of his human traits. He felt that he had a responsibility to youth and to his science; he encouraged budding young "rockhounds" by his patient identification of their treasures and by occasional gifts of so-called surplus specimens for their collections. In actuality the "scout box", a box from which boys and girls could take their pick, if they could identify the mineral, was supplied by Mr. Whitlock's own pocket book, the "surplus" specimens there were bought for the purpose from dealers. Mr. Whitlock went very little in the field, he was essentially a laboratory worker in his latter years and, hence, he collected few minerals. Nevertheless, he had many good friends and he succeeded in pursuading them that their fine specimens were better situated in the Museum where thousands could see them, than hidden in dark corners of their own collections.

Mr. Whitlock was a member of many organizations and received many honors. He was secretary of the Mineralogical Society of America from 1920 to 1922, and was elected president in 1933. The mineral whitlockite, a calcium phosphate found in North Groton, New Hampshire, was named in his honor in 1941. In 1942 he was elected an honorary member



HERBERT PERCY WHITLOCK

of the New York Mineral Club of which he was president 1928 to 1930. He was a popular figure among his fellows in the Museum and was greatly missed upon his retirement in 1941. The Museum profited greatly by having him as its curator of mineralogy for so many years, and the field of mineralogy has many recruits as a result of his inspiration and encouragement during their formative stages.

F. H. Pough

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Hill's New Catalog

V. D. Hill, Route 7-C, Box 188, Salem, Oregon, has released his new catalog No. 22. It is a 32 page publication and features facet cut gemstones, cabochon cut gemstones, choice crystallized mineral specimens, single loose crystals, gold-silver-copper specimens, polished specimens, meteorites, fluorescent lamps and minerals, etc.

This is an attractive publication with a number of fine illustrations. Send for your copy today—it's free!

SAPPHIRE AND GARNET OCCURRENCE

(*Continued from page 496*)

yond further use until resharpened.

In case the reader wishes further information concerning the many minerals occurring in the Turret region generally, he may consult the article entitled "Collecting near Turret, Colorado," page 16, January, 1947, issue, ROCKS AND MINERALS.

CLUB AND SOCIETY NOTES

ATTENTION SECRETARIES—If you want your reports to appear in the August issue, they must reach us by July 10th—the Editor.

Newark Mineralogical Society

The 256th meeting of the Newark Mineralogical Society was held at the Newark Museum, Newark, N. J., at 3:30 P.M. on Sunday, April 4, 1948.

The meeting was given over to discussion and plans for future activities of the club. Mr. Albert White reported that the McAfee limestone Quarry at McAfee, N. J., was to be worked again this summer after a long period of idleness. Since, in times past, this quarry was a rich source of minerals, the rockhounds of this vicinity are looking forward with considerable eagerness to what new blasts will bring forth. Even now, after long inactivity, beautiful apatite crystals can still be found in the old dumps. Mr. White, as outing committee chairman, is trying to arrange a trip to Franklin for the end of April.

Mr. Skidmore, the club's most ardent fluorescent mineral collector, plans to attend the First National Convention of Mineralogical Societies at Denver, Colorado, in June. He very generously offered to take a representative collection of New Jersey minerals, made up of the very best specimens from the private collections of club members, to show at the convention.

Plans were made by the members for packing and shipping these specimens, from which Mr. Skidmore will then arrange a display at the convention. In addition to displays of minerals by societies throughout the country, there will be commercial displays in which Mr. Skidmore will participate. Many beautiful New Jersey minerals are little known in the western part of our country. The society members felt, therefore, that this would be an excellent opportunity for eastern clubs to prove that ours is also a fertile field for the mineral collector.

Dorothy Webb
For Publicity

Independence (Mo.) Gem and Mineral Society

We are pleased to announce the formation of a new society in Missouri: The "Independence (Mo.) Gem and Mineral Society". This new group is interested in making new friends and invites anyone in the Independence-Kansas City area interested in rocks and minerals to attend our meetings and field trips. Regular meetings are held the last Tuesday of each month. Field trips are planned for Saturday and Sunday.

Jerry H. Manning
1525 Maywood
Independence, Mo.

Oxford County Mineral and Gem Association

The second meeting of the Oxford County Mineral and Gem Association was held Monday evening, April 5, at the home of Dana Putman. The main topic was "Where to go on our Field Trips". Many quarries and their minerals were covered in the discussion. There were several very good suggestions including panning gold in Swift River, Maine. There were 17 present. After the meeting, light refreshments were served.

Before the meeting, members showed the minerals they had brought. Two unusual specimens were a very rare mangano-columbite crystal brought by Mrs. Binford that they had found at Black Mt., Rumford, Maine, and a beautiful emerald cut, 7 carat caesium beryl shown by Thurston Cole. It was cut from a piece he picked up on the Newry, Maine, dumps.

The Association is open to all persons interested in mineral and gem collecting. Meetings are held on the first Monday of each month at the home of Dana Putnam, Rumford Corner; time 7:30 p.m. Plan to attend when you are in our neck-of-the-woods.

Mrs. Dorothy C. Putnam
Acting Secretary
R.F.D. #1
Bryant Pond, Maine

Feather River Gem and Mineral Society

At the February 26 meeting of the Feather River Gem and Mineral Society of Oroville, California, officers were elected as previously nominated. Membership cards were given to paid-up members. Discussion of field trips and ways of building up Society treasury. Before and after meeting, all attending viewed the extensive display of specimens, almost everyone having brought quite a number of "rocks." Mr. Bush displayed and explained use of diamond saw he had just completed.

A large part of the March 11 meeting was devoted to an open forum discussion of "Gem Stone Characteristics", and Mr. Bush spoke of the interesting experiments that may be tried with plastics.

Cutting and polishing of stones, and the various types of equipment for these purposes was discussed extensively at the March 25 meeting.

The first April meeting consisted in great part of a talk by the President, Mr. Bush, on fluorescent and phosphorescent rocks and minerals, and the different types of mineralights.

Mrs. F. E. Rankin, Secretary
Route 1, Box 131A
Oroville, California

The Georgia Mineral Society Meeting Gem Section

Those who attended the third meeting of the Gem Section have every good reason for not regretting it. Mr. LeGare Davis gave a most interesting talk on the identification of gems and gem materials. He outlined the physical and optical properties of the three types of gems and also had some very interesting comments on the new synthetic gems now appearing on the market. We were also amazed to learn that glass sometimes reaches a hardness of seven to seven and one-half on the Mohs scale.

Field Trip April 24 and 25, 1948, To Graves Mountain

This was a most unusual Field trip in that it was held on two successive days but was not a two day field trip. Dr. Furcron is to be highly commended on his unselfish work in leading and guiding the members and friends to the collecting areas on both days. Specimens of rutile for which the mountain is famous were hard to pick upon the surface and most specimens were found in the fields and on the north slope. Other minerals such as lazulite, pyrite, kyanite, pyrophyllite and hematite are abundant. The rarer minerals are barite, and ilmenite, turgite and limonite are common. This is still a Rockhounds paradise in spite of the scarcity of rutile. For a detailed account consult *Rocks and Minerals* for May, 1939, Pps. 131-141, for an article by Peter Zodac which is still up to date except that the highway is now paved.

Regular Monthly Meeting

A most unusual meeting was held on Monday evening, May 3, 1948, when, the Reverend Owen Hoffman of Washington, Ga., gave a unique demonstration of Fluorescent Minerals with both the long wave and short wave Ultra Violet black lights. The demonstration was put on in a masterful manner and the audience was held to the edge of their seats through the entire time. The Rev. Hoffman explained how he tied in Religion and Science to get and hold the attention of both adult and childrens audiences. One feature of the talk was centered around a box with compartments holding several different minerals and, when the electric lights were turned off the black light was held toward the box which then in all its beauty in the shape of a cross. The edges of the compartments having been painted with a red fluorescent paint thus outlining the cross. It was a breathtaking sight to behold, and there were many ahs and ohs from the audience.

After this he brought forth a table covered with large specimens of fluorescent minerals from Franklin, N. J., and other locations, which were beautiful beyond description under the light. One odd feature was a stone the Rev. Hoffman called pavementite, which was part of the old pavement at Franklin, N. J.; this specimen fluoresced in several different colors, and no one could identify it until told what it was.

Rev. Hoffman then gave all who wanted one a Franklin specimen and very few refused. This most unusual meeting was then adjourned, and Rev. Hoffman was almost smothered with questions about fluorescent minerals and lights.

S. C. Knox

N. O. T. S. Rockhounds

Participating for the first time in the Annual Desert Wild Flower Show held at the Naval Ordnance Test Station, Inyokern, California, April 17 and 18, 1948, the N.O.T.S. Rockhounds arranged an extensive exhibit of minerals and rough and cut gems. The collection was particularly complete as to local material which were featured.

Specimens included opals, petrified wood, agate, and jasper from the El Paso Mountains; copper, silver, lead, and other varieties from the Darwin and Cerro Cordo mines of Inyo County; a very complete collection of the lake minerals from Searles Lake; and material from Lead Pipe Springs, Greenhorn Mountains, Inyo Mountains, Death Valley, Panamint Valley, and the Calico and Barstow regions, all immediately accessible to the Rockhounds members.

The collection mustered five large cases for specimens, eight microscopes of micro-mount materials, nearly 2000 cut and polished pieces, jewelry made by members, and a beautiful fluorescent display made up of material from collections of members bolstered by large spectacular pieces generously loaned by the Mineralight Company of Los Angeles.

Of special interest was a beautiful lamp and shade inset with agate, quartz, and calcite slabs made by C. V. Sanford.

Arrangements were under the direction of D. F. MacLachlan with Ralph Dietz in charge of displays.

Mineralogical Society of Southern Nevada, Inc.

March, 1948, Meeting

Beginning an organized program of study on various minerals, was the project of the business meeting for the month. The opening discussion was by Mr. J. Wood, President, who described the formation of various rocks and rock types. His talk was designed to lead up to the next address on the program which was given by Mr. M. G. Mastin, on the chemistry of sulphide minerals. Following this Mr. D. McMillan, Vice-President, demonstrated practical field tests for the sulphide group.

Results of the Mineral Show held March 6th, are still being manifested, in the added interest in the study of minerals, geology, and fluorescence. To keep this interest the Society is sponsoring along with their one lecture a month, and the program following their business meeting, weekly instructions in mineral identification.

A fluorescent display was given by Mr. D. McMillan to the Boulder City and Trona Branches of American Chemical Society, on Saturday, April 17th.

D. McMillan

New York Mineralogical Club

Columbia University (Schermerhorn Building, New York City, Wednesday, April 21, 1948

The nominating committee proposed that the following be elected to office for the coming year:

President .....Dr. Frederick H. Pough
1st Vice-President .....Dr. Ralph J. Holmes
2nd Vice-President .....Mr. Leo N. Yedlin
Treasurer .....Dr. Cecil H. Kindle
Secretary .....Mr. Purfield Kent
Directors .....Mr. O. Ivan Lee
Mr. James A. Taylor

The speaker of the evening was Dr. William Foshag, of the United States National Museum, who spoke on his "Geological Experiences in Japan". Dr. Foshag was sent to Japan to examine gem material collected by the Japanese during the war. While he was there, Dr. Foshag visited the cultured pearl fisheries which were developed chiefly by K. Mikimoto. The procedure is to cut an epithelium sac out of the mantle of an oyster and place a mother-of-pearl bead in this sac. Then an incision is made in the mantle of another oyster generally two to three years old, and the sac with the included bead, is carefully inserted in this incision. These oysters are then placed in wire cages and hung from rafts in the bay for a period of four or five years. The rafts are capable of being moved from one part of the bay to another to keep the oysters in a favorable environment and to move them away from natural enemies such as the starfish.

When the pearls are recovered they are boiled gently in a solution of hydrogen peroxide to bleach the organic material and then are left in the sun for a few days to improve their lustre.

The talk was accompanied by a colored motion picture.

Purfield Kent
Secretary

Rock Club Formed At Ketchum, Idaho

A new club of "Rock Hounds" to be known as the Jade and Jasper Club has been formed. Charter members are Mr. and Mrs. Glenn Brado, Mr. and Mrs. Andrew Beck, the D. P., R. H and H. E. Wescott families, and Mr. and Mrs. Jess Zimmerman of Ketchum, Mr. and Mrs. F. W. Crane of Los Angeles, Cal., Mr. and Mrs. Reese Howell of Hailey and Mr. and Mrs. Morris Winn of Gannett.

The purpose of the club will be to adopt a systematic procedure for collecting, studing, exhibiting and exchanging rock and mineral specimens. Also to get together a collection of rock specimens for this vicinity. Specimens contributed will be carefully recorded and marked for identification as to individual ownership.

For the time being the address of the club will be Box 758, Ketchum, Idaho. Anyone interested is asked to write or contact any of the members.

Pacific Mineral Society

Mr. Clarence Woods, retired mining engineer, entertained the Pacific Mineral Society with colored movies on Peru, including pictures of the San Domingo mine where Mr. Woods had spent some time. In his estimation, the gold is only one fourth to one half worked out, but due to the lack of education in the highlands, inaccessible roads, and lack of proper exploitation, it will be some time before mining will make a name for itself in Peru.

The wealthy sheep owners live along the coastal plains and hire the Indians to tend their sheep in the higher altitudes due to the fact that these natives are more adapted to the high places and have 25% more lung capacity. These natives used llamas as their means of conveyance of materials. The pictures included a trip to the Fort near Cuzco, where Gonzalo Pizzarro made his last stand in 1548 when he tried to dispossess Blasco Nunez, the market at Cuzco, Religious Festivals, and a trip to Lake Titicaca. This lake is high in the mountains at an altitude of 12,500 feet. The natives in this area build their boats out of bull-rushes because of their buoyancy and even their sails are constructed of these same materials. It was interesting to note that in this area, they could only raise Zebu cattle from India due to the high altitude and here the natives used a crooked stick to plough their fields. Mr. Woods was fortunate to obtain some pictures of intricate pieces of pottery and of the graves north of Lima where some archaeologists were working. These graves were of the Pre-Incarial period which was very advanced in sculpturing and civilization.

Field trip for April was along the Angeles Crest Highway for Labradorite, Illmenite, and Epidote crystals.

Mrs. A. E. Allard, Pub. Chmn.
3133 Live Oak St.
Huntington Park, Calif.

Gem Stone Collectors of Utah

A regular meeting of the Club was held Friday, March 26, 1948, in Salt Lake City with 200 present. Dr. B. D. Bennion presided. Minutes of the previous meeting of February 19th were read and approved.

Dr. Bennion introduced the speaker, Mr. Alfred M. Buranek, geologist for Raw Material Division, Utah State Department of Publicity and Industrial Development, and a fellow member. "Al" gave us a colored pictorial on the story of Gems which consisted of 125 slides covering all phases of gem stones:—the location, the crystals as found, the cutting, grinding and polishing steps necessary to bring about a beautiful cabochon or facet.

An interesting and colorful display of gem stones were brought by the members.

K. O. Stewart, Secretary
67 So. State
Salt Lake City 1, Utah

Eugene Mineral Association

The Eugene Mineral Association, of Eugene, Oregon, would like to convey greetings from the West Coast to collectors over the country who read this fine magazine.

This association is an organization primarly of amateurs, as distinguished from professionals, although some of the members are experienced enough to be professionals. It is not exclusively for Eugeneans (there are members enrolled from several localities outside of Eugene) and in that respect the title is a misnomer.

Though only two years old, the group has grown from a handful of seven men to a present membership of sixty-two, and is, of course, expanding. The association is extremely fortunate in having the cooperation and assistance of the University of Oregon Geology Department, and other related departments, as well as of Dr. Warren D. Smith, recently retired head of the Geology Department at the University. Benefits from this source have been four-fold: The group has had the use of a large room in Condon Hall on the campus for its semi-monthly meetings; it has had the privilege of viewing and studying the fine exhibit of geological specimens on display there; it has been able to draw on faculty members of the University for lectures, and members of the Geology department have been most obliging about identifying specimens for the society's members.

Programs usually include a talk or lecture; sometimes there are colored slides. Ordinarily there are interesting specimens displayed at each meeting. Once a year, in April, a banquet is held, at which time the new officers are introduced. Usually during the summer there is at least one picnic for the entire group, and there are field trips from time to time to obtain specimens, especially during the warm months, although some of the members do get out and collect during the wet weather.

Oregon abounds in fine geological material. Agates, jasper and petrified wood are plentiful in the stream gravel beds, along the beaches, and in the so-called Central Oregon region; excellent specimens of zeolite, quartz, garnets and other crystals are available; gold, silver, copper, nickel and quicksilver are mined, and other metals are found also; and there are fossils and artifacts enough to make hunting interesting for those who wish to collect them.

The ages, interests and extent of the collections of the members of this group vary considerably. One member, who is over eighty-six years of age, has been collecting for over fifty-five years. You can guess than that he has a magnificent collection. On the other hand there are a few members who do not yet have a collection, but who find rocks intriguing and come to learn about them. A few of the members are of school age and are fascinated by any rock that is pretty. Many of the members have collected for no more than a year or two, though there are four or five who have been collecting for fifteen or twenty years.

The interests also vary. One member is interested only in crystals and collects those exclusively; several are interested largely in artifacts; quite a number collect agates, jasper, petrified wood, opal and other cutting material (a number have their own lapidary outfits). At least three members have fine collections of fluorescents; micromounts interest several, and one high school boy has an excellent collection of well identified minerals, which won him first prize among some two hundred entries at a recent Springfield High School Hobby Show.

Fees are nominal: There is an initial fee of $1.00 per member payable at the time of application for membership, plus a regular membership fee of $1.50. After the first year, the fee is simply the $1.50 per year per member, of course.

Recently elected officers of the Eugene Mineral Association include: President, C. R. Rees; Vice-President, F. R. McCabe; Secretary-Treasurer, Alberta Heffron, and Custodian, L. H. Kerlee. Mrs. Frederick Davis was elected to the Board of Directors to serve for three years.

Anyone living in the locality of Eugene is welcome to attend meetings and belong to the group if he or she is interested in collecting.

Alberta E. (Mrs. Lee) Heffron
Secretary-Treasurer
Eugene Mineral Association
126 City View Blvd.
Springfield, Oregon

Cincinnati Mineral Society

A regular monthly meeting was held at 8 p.m., Wednesday, April 28, 1948, at the Cincinnati Museum of Natural History, Cincinnati, Ohio. The meeting opened with the reading and approval of the minutes of the previous meeting by our Secretary, Miss De Honey.

A brief discussion of the field trip of April 11, 1948, to Copperas Mt., Ohio, followed. Minerals found at this location by members were: marcasite concretions with pyrite coatings, oil shale with asphaltum globules, calcite containing petroleum, cone-in-cone limestone, dolomite, halotrichite, quartz crystals, small gypsum crystals, and siderite. A sidetrip to an asphaltic limestone quarry was included.

The report of the committee for compiling data on local mineral areas presented a plan for recording the data; the plan was adopted. Miss De Honey, Miss Brockschlager, and C. L. Gschwind were the reporting committee.

In view of the increased interest in cutting and polishing, a suggestion that every fourth meeting be devoted to this was adopted.

A motion for the appointment of a program committee to plan meetings was also adopted. Appointments will be announced at the next meeting by our president.

Mr. Joseph Tressell, a Cincinnati silversmith of considerable repute, was welcomed as a new member.

Mr. Ed Herschede was introduced as a guest of Mr. Ralph Dury. Mr. Herschede is a certified gemologist.

Mr. Howard Bradtmueller was introduced as the speaker of the evening; his topic was "Swapping and trading of minerals, rocks and fossils." Mr. Bradtmueller is particularly qualified to cover this topic. His start in this field got under way some years ago with a visit to the Rocky Mountain National Park. A large fossil which he saw imbedded in a fireplace at the lodge where he was staying, aroused his interest in fossils. Living in Cincinnati, plenty of excellent Ordovician fossils were his for the finding. Using these as swap material he made contacts in the west and south and eventually made a swap for some fossils of the type which launced him on his swapping career. In addition an excellent collection of western and southern minerals came his way as a result of shrewed use of the material available and fair trading practices with other traders. Mr. Bradtmueller's brief, concise talk held the interest of all and was met with much enthusiasm. An inspection of the material collected by Mr. Bradtmueller followed the talk.

The balance of the meeting was devoted to cutting and polishing with some excellent cabochons well under way. Mr. Tressell showed some fine workmanship on an Australian opal. All cutting and polishing is being conducted under the able direction of Mr. Warren Wells.

Charles L. Gschwind,
Corresponding Secretary

L. A. L. S. to Exhibit at Long Beach

The Los Angeles Lapidary Society will hold its SIXTH ANNUAL SHOW at the convention of the California Mineralogical Societies at the Long Beach Municipal Auditorium, July 16, 17, and 18th.

All of the 200 members of the Society have joined the "Eager Beaver Club". Every one of them has his "nose to the grindstone" producing some of the most exquisite gemstones to be seen anywhere. Most of the semi-precious stones will be California materials, although there is hardly a state, or a country in the world, that will not be represented. There will be gold and silver jewelry, made by the members, as mountings for beautiful cabochons and faceted gems. Also spheres, novelties, practical arts, flats, geodes and nodules of surprising beauty and variety will be shown.

You cannot afford to miss this outstanding display.

Show Chairman, Clarence Chittenden, Box 2184, Terminal Annex, Los Angeles 54, Calif.
SHOW PUB. COMM.
Victor Gunderson, Chm.

Pacific Mineral Society

Dr. D. F. Hewett, Staff Geologist for the U. S. Geological Survey, gave a timely talk on the "Good Springs, Nevada, Quadrangle" in view of the fact that the Pacific Mineral Society's field trip for May will be to that area. Dr. Hewett spent nine months of the year 1921 in Good Springs and during that period, he wrote up 72 mines. He is well known for his "Geological Survey Professional Paper 162" on Geology and Ore Deposits of the Good Springs Quadrangle, Nevada", published by the United States Geological Survey.

Although the ore in this area was apparently known by the Paiute Indians and possibly by the old Spanish Priests, nothing was done about it until the year of 1856 when Brigham Young sent some of his men to find out about the rumors of lead in the Potosi district. Early in 1857, they smelted their first ore and produced approximately 9,000 pounds of lead. There were sporadic discoveries in the years of 1860 to 1890. During 1892 and 1893, many new claims were located because a branch railroad from Goffs to Purdy was constructed. Little effort was made to mine lead ore until 1905 when the main railroad which is now Union Pacific was extended to the town of Jean. These mines were opened by average people instead of mining syndicates and were unpatented and run by assessment. Good Springs reached its peak in 1918 and by 1921 was finished. Ores found in this area were of carbonates, sulphates, silicates, vanadates, molybdates and arsenates. Native gold was found in the Keystone mine and some platinum was discovered in the quadrangle. The deepest mine is only 700 feet deep. Since 1907, this has been the principal source of zinc in Nevada.

Mrs. A. E. Allard, Pub. Chmn.
3133 Live Oak St.
Huntington Park, Calif.

Texas Mineral Society

The Texas Mineral Society of Dallas met for its regular monthly meeting in the Baker Hotel April 13, 1948.

A very interesting and unusual talk on "GEMS OF THE BIBLE" was given by Rev. H. E. JONES, Pastor of the First Methodist Church in Grand Prairie, Texas. Numerous Gems are mentioned in the Bible in approximately 325 places. In the places where Gems are referred to, they always signify DURABILITY, VALUE AND BEAUTY.

Attendance at the TEXAS STATE MINERAL SOCIETY Exhibit in Austin, Texas, was discussed.

Ralph D. Churchill
Secretary-Treasurer
2003 Republic Bank Bldg.
Dallas, Texas

Rogue Gem and Geology Club

A new rock club has been organized in Grants Pass, Oregon. It is to be known as "Rogue Gem & Geology Club". The meetings are held on the 1st Friday of the month at 8:00 P.M. in the Library Auditorium. Visitors are welcome. Officers are: President, Dr. E. C. Macy; VicePresident, Joseph W. Reeves; Secretary-Treasurer, Mrs. Arline Sims.

Mr. A. F. Sims, of the Hodge Podge Shop, who was instrumental in the organization of the new club, was speaker of the evening at the May meeting. He gave an account of his recent rock trip in So. California and displayed polished specimens from material found on the trip. There were 26 present.

Mrs. Arline Sims
Secretary-Treasurer

Northern California Mineral Society

On March 14th we moved to our new quarters which was opened with appropriate ceremonies. A large number of members and friends were in attendance and a number of members displayed their collections of specimens and polished stones, all in all a wonderful time was enjoyed by all present and the day was finished up with coffee, cake, and sandwiches. Miss Jessie Unwin was hostess, ably assisted by a number of lady members.

March 21st Mr. Bert Walker led a field trip to Marin County, over 100 members and friends made the trek and enjoyed a wonderful day. Everybody secured specimens of Actinolite and Garnets quite a number were fortunate in finding excellent specimens of Serpentine, Lawsonite and some Glaucophane.

April 21st Mr. Richard Crippen of the State Mining Bureau gave a talk on "Biconoids"—unusual concretions from Tempelton, Calif. Their origin is puzzling and their shape is very rare in nature. These unusual concretions were first found by Mr. C. Hoff of Tempelton while looking for rocks for his garden. The next issue of the *State Journal of Mines* will contain an article on these concretions.

Saturday evening, April 10th, was enjoyed by a large number of members at an old fashioned basket party.

Sunday, April 18th, under the leadership of Lloyd Mabie, over 40 members and friends made a trip to Pascadero beach where every one found moonstones, agate, jasper and some were fortunate in securing some fine specimens of fossil bones.

Since the installation of Mr. Charles Hansen as president in January we have added over 40 new members to our roster. On April 22nd the lapidary shop was opened in our quarters and the classes are rapidly filling up. There is no charge for instructions as all equipment is owned by the Society.

Si Lubarsky, Comm. Chrm.
601 O'Farrell St.
San Francisco, Calif.

Flint Hills Geology Club

Flint Hills Geology Club is the name selected for Emporia's newly organized club. Its second meeting was held May 15 with Dr. D. C. Schaffner, for many years head of the geology department at the College of Emporia, speaking on concretions and geodes. Dr. Schaffner was assisted by Professor Hal Bender, who spoke briefly on critical and strategic minerals, emphasizing the need for conservation.

New officers are as follows: President, George M. Emrich; Vice-president, Hal Bender; Secretary-treasurer, Mrs. W. D. Jones. Fourteen members have registered. Plans were made at the meeting for a field trip to Franklin County, Kans. on June 6.

Mrs. W. D. Jones, Secretary
406 Rural St.,
Emporia, Kans.

The Oklahoma Mineral and Gem Society

The Oklahoma Mineral and Gem Society met at the Markwell Brothers for their April meeting. The Markwell Brothers met all guests as they drove in and showed them their fine Rock and Gem Collection, plus their excellent work shop full of fine cutting and polishing equipment.

The Markwell Children served as escorts from the shop to the upstairs apartment of their fine two-story rock home.

Mrs. Loys Lankford brought us a very interesting talk on the Minerals and Gems found in the Pacific Coast States. She brought special specimens from her own collection to show us. She had Palm Wood, California Onyx, Motted Agate, and others. In spite of the various legends as to the origin of Thunder Eggs, all members of the Society now know the true story as they were introduced to the bird that lays the eggs. (The Lankfords constructed a very clever looking bird out of different rocks from their own collection and introduced it as the Thunder Bird).

Mrs. Kennedy, who was to have the second half of our program, was unable to make the meeting due to ill health, so Mr. Sprankle was kind enough to fill this gap in the program with a very interesting trip in color slides, on the state of Colorado. Mrs. Sprankle furnished the narrative. Some of the wives became homesick before the Sprankle part of the program was over, and probably some of the husbands are trying to explain why they cannot go home for a visit immediately.

When the meeting adjourned, the Markwells served refreshments that were quite plentiful, very appetizing and served in a manner to make all guests feel very comfortable and quite at ease; true hospitality which was greatly appreciated by all members.

Mrs. Linton T. Riggs
3233 N.W. 12th,
Oklahoma City 7, Okla.

UNIVERSITY OF MICHIGAN LIBRARIES

Mineralogical Society of So. California

Mr. E. V. Van Amringe, from the geology department of Pasadena Junior College, was the speaker at the April meeting of the Mineralogical Society of Southern California. His subject was "Zircon".

Mr. Van Amringe referred to this gem stone as the "mystery mineral", for it is a most startling gem scientifically and there is much about it that is yet to be understood. Most of the references to Zircon are found in early mineralogical literature and are for the most part not readily available. It is a silicate of zirconium with a chemical formula reading $ZrSiO_4$, but it has some iron always present and may also include a long list of other elements such as tin, lead, bismuth, aluminum, nickel, uranium, zinc, lithium, radium, helium, and others. Some most reputable chemists have declared that they have found new elements in Zircon. Their claims have never been accepted and their findings are presumed to be just a persistent retention of impurities in tiny amounts.

Zircon is widely distributed and has a fairly common occurrence in igneous rocks of the more acid feldspathic groups. More rarely it occurs elsewhere as in granular limestones, schists and gneisses, and more rarely still in volcanic rocks. It crystallizes in tetragonal crystals, usually in stubby prisms, with twinning rare. It is one of the earliest minerals to crystallize from cooling magma and therefore the crystals are usually well formed. Its range of density varies from 4 to 4.8 (a surprising range in a gem stone), its range in refractive index is from 1.80 to 1.99, and its color, though mostly brown and opague — ranges from brown, red, gray, yellow, green and blue to colorless. The red and gold yellow colors are those most preferred.

Zircon is used not only as a gem stone, but as a source of zirconium oxide in the manufacture of incandescent gas mantles. Zirconium is also a good scavenger, readily taking up sulfur and eliminating it, and has been used in this way in the steel industry.

The application of artificial heat is used to develop the beautiful colors which many gem zircons show. When zircons are heated, some come out blue, white or yellow but most come out a poorer color than when started. There has been no really satisfactory explanation for this behavior.

Although many of our zircons come to us from Siam, practically none are produced there. They are found instead in the stream gravels of the Mekong River in French Indo China—brought down to Siam where they are cut and heat treated.

A number of the peculiarities of this stone were told. For instance, in certain localities only—Norwegian and French—zircons will phosphoresce when heated and the density will be permanently increased. Zircons are more radioactive than any igneous rocks and further, zircons decolorized by heating can regain color by exposure to radium rays.

Mr. Van Amringe left his audience with a desire to know more of this peculiar and interesting gem stone. He indicated that there was room for much more research concerning it. From his own collection of gem stones, Mr. Van Amringe displayed a set of beautiful faceted zircons.

Pauline Saylor
Covina, Calif.

Eleventh Anniversary Dinner and May Meeting of the Queens Mineral Society

On April 6th the Society celebrated its eleventh anniversary with a well attended dinner. The dinner committee consisting of Mr. Maynard, Mrs. Segeler and Mr. Helbig, accomplished arrangements that left nothing undone to assure a perfect evening.

Mr. Yedlin was the Guest speaker, and very capably held the interest of all present.

May Meeting

Mr. Allen Green was the featured speaker at our meeting held on May 6th.

Mr. Green has been a member of our group for many years and has collected specimens of metallic ores and other species since he studied mining engineering many years ago. He possesses an outstanding collection of fine specimens of rare species which he has thoroughly studied and analyzed. In the past, we had been favored with talks by Mr. Green which were always well delivered and informative.

Mr. Green chose as the evening's subject, "Colorful Copper Ores and The Rare Phosphates and Arsenates of Copper."

Mr. Green proceeded to describe the secondary minerals found in the capping veins, or gossans, in this and other countries. It was explained that their presence usually produce, predominately, Arsenates and Phosphates, Volcanic and acidic magma influences were described, and, in many instances, illustrated by specimens from our country or from foreign areas.

Among the many fine specimens displayed were, Olivenite, Libethenite, Higginsite, Descloizite, Cuprodescloizite, Pseudomalachite, Dihydrite, Turquois, Chalcosiderite, Torbernite, Eukairite, Conichalcite, Balydonite, Leucochalcite, Chalcopyhyllite, Aurichalcite, Cuprite, Chalcotrichite, Covellite, Azurite, Cuprite, Malachite, Chalcocite, Chrysocolla, Linarite, Crocoite, Shattuckite, Dioptase, Tsumebite, Cornetite, Whitneyite, Domeykite, Bornite and many others.

Mr. Green concluded his talk by answering any questions the members had to ask.

A rising vote of thanks concluded the evening.

William Stadler, Sec.

AN EXCEPTIONAL OCCASION TO SERIOUS LAPIDARIES

A new purchase allows us to offer the finest professional lapidary equipment for sale at very low prices. We list a few of the items below but many more are available too numerous to mention. Write for a detailed listing of this sale and order promptly. All material is used but in very good condition.

PERIRHERY CHARGED DIAMOND WHEELS: 7-8 and 10" sizes up to 1" cutting surfaces—Famous makes (were valued up to **$500**) **$25** to **$150.**

WHEELS: Copper, tin, and bronze and iron laps. Also misc. carborundum wheels in smaller sizes. Send description of needed items.

MOTORS: ¼, 1/3, and ½ H.P. famous makes as Westinghouse, Delta, G.E., Klunder, Janette, mostly D.C. Bargain prices from **$8** to **$10** each.

ARBORS: 30" shafts Heavy duty—ball bearing 1" thickness. Also misc. ¾ and 1" heavy duty shorter lengths—from **$12** each up.

VERTICAL GRINDER: Dual Blanchard type for 6" wheels 1 H.P. motor, like new complete with plates (1 available) first check for **$85.**

SAW BLADES: Mostly Felkers 6 and 8" selected from **$2** each up.

SPINDLE UNITS: From professional benches 20" lengths ⅞ thick, complete with holding arms and bushings. Wheels available for these units.

1 FELKER SAW, model 80, left—in excellent condition, complete with hydraulic pump and motor, **$175.**

PROFESSIONAL FACETTING BENCHES

Complete units for two persons, 54"x21"x36" high including two 10" laps (our choice—tin, lead, copper, etc.) 1 motor ¼ or 1/3 H.P., two 20" spindles, 2 Jampegs, complete wired, 4 metal legs braced to the first 5 people who send a **$100** check.

The above mdse. is priced for delivery at our office. All shipping charges extra. Write for more detailed listing of this special sale folder No. 121.

ASTERIATED QUARTZ: Good material for cutting those star gems. Per pound at **$2.00.**

TIGEREYE: Choice even grained golden material for cutting two types of "eyes", per pound **$2.** 10 lbs. for **$17.50.**

BLOODSTONE: Selected material available in slabs at **$10.** per lb., or in rough at from **$3** - **$6** per pound.

ONYX BLANKS: For commercial cutters, available in standard sizes and in colors of carnelian, greenonyx, and blackonyx, 100 asst. blanks—**$20** - **$30.** Write for wholesale quotations.

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